

Zoological Record

Vol. 95, Sect. 15, 1958

PISCES

COMPILED BY

G. PALMER (Recent) and

E. I. WHITE, D.Sc., F.R.S. (Fossil)

LONDON

PUBLISHED BY

THE ZOOLOGICAL SOCIETY OF LONDON

PRICE EIGHT SHILLINGS AND SIXPENCE

December 1960

SEPARATE SECTIONS OF THE ZOOLOGICAL RECORD

In addition to the complete bound volume, the separate Sections may be obtained singly, bound in printed paper covers.

The following are the Sections and their prices, viz.:—

	<i>s.</i>	<i>d.</i>
1. Comprehensive Zoology	3	0
2. Protozoa	10	0
3. Porifera	2	0
4. Coelenterata	4	0
5. Echinodermata	4	0
6. Vermes	10	0
7. Brachiopoda	4	0
8. Bryozoa	2	6
9. Mollusca	10	0
10. Crustacea	6	6
11. Trilobita	5	0
12. Arachnida	10	0
*13. Insecta	50	0
14. Protochordata	2	0
15. Pisces	8	6
16A. Amphibia	6	0
16B. Reptilia	7	6
17. Aves	10	0
18. Mammalia	10	0
19. List of New Genera and Subgenera	4	0

* Obtainable only from the Commonwealth Institute of Entomology, 56, Queen's Gate, London, S.W.7.

15. PISCES

COMPILED BY

G. PALMER (Recent) and

E. I. WHITE, D.Sc., F.R.S. (Fossil)

CONTENTS

	PAGE
I. TITLES	1
II. SUBJECT INDEX	85
III. SYSTEMATIC INDEX	102

I.—TITLES.

The year of publication of a title is omitted from the reference where it is the same as the volume year of the 'Record' namely 1958.

Direction 87. Completion and, in part, correction of the entries on the *Official List of Generic Names in Zoology* in regard to the generic names *Cottus* Linnaeus, 1758, and *Conger* Oken, 1817 (Class Pisces) made by the rulings given respectively in *Opinions* 77 and 93 published in the period up to the end of 1936 and matters incidental thereto. *Opin. int. Comm. zool. Nom.* 1F : 1-16.

Opinion 513. Determination of the species to be accepted respectively as the type species of the genera *Culter* and *Nasus* both of Basilevsky, 1855. *Opin. int. Comm. zool. Nom.* 18 : 291-302.

Resolution supplementary to **Opinion 485.**

On the subject of the relative priority to be assigned to the names *Cheirodon azeirodi* Schultz (L.P.) and *Hyphessobrycon cardinalis* Myers (G.S.) & Weitzman (S. H.) (Class Pisces), both names being published in February, 1956. *Opin. int. Comm. zool. Nom.* 17 (23) : 104A-104J.

Anon (1). Inventaire de la faune marine de Roscoff. Poissons. *Trav. Sta. biol. Roscoff N.S.* 7 34 Suppl. 8 1956 : 1-67.

Anon (2). Dr. Sundar Lal Hora. *Indian J. Helminth.* 7 (1) 1955 [1957] : 3-4 1 pl.

Anon (3). A guide to the fisheries of Ceylon. *Bull. Fish. Res. Sta. Ceylon* No. 8 : 1-72 15 pls.

Aasen, O. Estimation of the stock strength of the Norwegian herring. *J. Cons. int. Explor. Mer* 24 : 95-110.

Abdel-Aziz, I. Notes on the anatomy of larval *Polypterus*. *Proc. Egypt. Acad. Sci.* 12 1957 : 79-87 12 figs.

(**Abdullayev, M. A.**) [On the cases of cannibalism in *Gambusia affinis holbrooki* Gir.] *Zool. Zh.* 37 : 1101-1102. [In Russian with English summary.]

Abe, T. Two new subspecies of fishes from the path of the "Kuro-Shiwo." *Rec. oceanogr. Wks. Japan. Spec.* no. 2 : 175-180.

Abe, T. & Takashima, Y. Differences in the number and position of two kinds of fin supports of the spinous dorsal in the Japanese mackerels of the genus *Pneumatophorus*. *Jap. J. Ichth.* 7 (1) : 1-10, 2 figs.

Abe, T. *see* Tomiyama, I.

Abegglen, C. E. *see* Nelson, P. R.

Abolins, L. Sexual differences of carotenoid content in the skin of *Labrus mixtus* Kroeyer. *Acta zool., Stockh.* 38 1957 : 223-238.

Abood, L. G. *see* Walaszek, E. J.

Abramson, H. A. *see* Evans, L. T.

Acara, A. (1). Research on mackerel. (*Scomber scomber* L.) oil. Proc. Fishl Counc. Mediterr. F.A.O. 4 1957 : 175-179, 6 figs.

Acara, A. (2). Relation between the migration of *Sarda sarda* Bloch and prevailing temperature. Proc. Fish Counc. Mediterr. F.A.O. 4 1957 : 193-196.

Acara, A. see Demir, M.

Adams, T. The ichthyokinometer, an improved ichthyometer for studying action of chemical agents quantitatively in fish. Amer. midl. Nat. 59 : 254-255 1 fig.

Adascalitei, E. see Necrasov, O.

Adelman, W. J. & Haskell, D. C. The excitability of the brown trout. Physiol. Comp. 4 1957 : 375-387 3 figs.

Adinolfi, M. & Chieffi, G. Larval and adult haemoglobins of the cyclostome *Petromyzon planeri*. Nature, Lond. 182 : 730 1 fig.

Agrigoroaie, St. see Jitariu, P.

Ahlstrom, E. H. & Counts, R. C. Development and distribution of *Vinciguerra lucetia* and related species in the Eastern Pacific. Fish. Bull. U.S. 58 : 363-416 29 figs.

Ahmad, N. (1). Fish fauna of East Pakistan. Pakistan J. Sci. 5 1953 : 18-24.

Ahmad, N. (2). Hilsa fishery of East Bengal. J. Asiat. Soc. (Sci.) 20 1954 : 7-14 6 figs.

Ahmad, N. (3). Transplantation of food fish in East Pakistan. Pakist. J. Sci. 8 1956 : 167-170 2 figs.

Akazaki, M. Studies on the orbital bones of sparoid fishes. Zool. Mag., Tokyo 67 : 322-325 1 fig. [English summary.]

Akyüz, E. F. Observations on the Iskenderun red mullet (*Mullus barbatus*) and its environment. Proc. Fish. Counc. Mediterr. F.A.O. 4 1957 : 305-326 18 figs.

Akyüz, E. F. & Artüz, I. Some observations on the biology of tuna (*Thunnus thynnus*) caught in Turkish waters. Proc. Fish Counc. Mediterr. F.A.O. 4 1957 : 93-99 4 figs.

Alabaster, J. S. see Allan, J. R. H.

Albe-Fessard, D. see Couceiro, A.

Albuquerque, R. M. see Serra, J. A.

Alderdice, D. F. & Wickett, W. P. A note on the response of developing chum salmon eggs to free carbon dioxide in solution. J. Fish. Res. Bd. Can. 15 : 797-799 1 fig.

Alderdice, D. F. & others. Some effects of temporary exposure to low dissolved oxygen levels on Pacific salmon eggs. J. Fish. Res. Bd. Can. 15 : 229-250 8 figs.

Alderdice, D. F. see Brett, J. R.

(**Aleev, Y. G.**) (1). [Adaptation of motion and manoeuvrability in fish.] C.R. Acad. Sci. URSS 120 : 510-513 2 figs. [In Russian.]

(**Aleev, Y. G.**) (2). On the movement of *Zeus faber* L. Zool. Zh. 37 : 463-465. [Russian with English summary.]

(**Alekseeva, S. P.**) [Contribution to the studies on the sexual cycle of carp in Volga delta.] Vop. Ikhtiol. 9 1957 : 55-67 4 figs. [In Russian.]

Alexa, E. see Jitariu, P.

Alexander, E. C. see McKenny, T. W.

Alfred, F. R. The food and habitat of the fighting fish. Malay. nat. J. 12 : 161-163.

Al-Hussaini, A. H. & Lufly, R. G. On the microscopic anatomy of the skin of fishes. I. The histology of the skin of some silurids of the Nile. Ain. Shams Sci. Bull. Cairo No. 3 215-263 text-figs. 1-22.

Al-Hussaini, A. H. & Rizkalla, W. (1). The thyroid gland of the cichlid fish, *Tilapia nilotica*. Ain Shams Sci. Bull. Cairo No. 2, 1957 : 85-106 pl. i text-figs. 1-4. (Summary in Arabic).

Al-Hussaini, A. H. & Rizkalla, W. (2). The thymus gland of the cichlid fish *Tilapia nilotica*. Ain Shams Sci. Bull. Cairo No. 2 1957 : 107-134 pls. i and ii, text-figs. 1 and 2. (Summary in Arabic).

Al-Hussaini, A. H. & Rizkalla, W. (3). The pancreas and islands of Langerhans in the cichlid fish *Tilapia nilotica*, L. Ain Shams Sci. Bull. Cairo No. 3 : 165-190 pls. 1-iii text-figs. 1-3. (Summary in Arabic).

Al-Hussaini, A. H. & Rizkalla, W. (4). The gonads of the cichlid fish, *Tilapia nilotica*, L. Ain Shams Sci. Bull. Cairo No. 3 : 191-214 pls. i-ii, text-figs. 1-5. (Summary in Arabic).

Ali, M. A. *see* Brett, J. R.

Alikunhi, K. H. *see* Chaudhuri, H.

Allan, I. R. H. & others. A field and laboratory investigation of fish in a sewage effluent. Fish. Invest., Lond. Ser. 1. 6 No. 2 : 1-76, 51 figs.

Allen, G. H. Survival through hatching of eggs from silver salmon (*Oncorhynchus kisutch*). Trans. Amer. Fish. Soc. 87 (1957) : 207-219 3 figs.

Allen, G. H. *see* Donaldson, L. R.

Allin, A. E. The introduced fishes of Thunder Bay, Ontario. News Lett. Thunder Bay Nats. Cl. 11 1957 : 27-31.

Alm, G. Seasonal fluctuations in the catches of salmon in the Baltic. J. Cons. int. Explor. Mer 23 : 399-433 13 figs.

Altamirano, M. & Coates, C. W. Effect of potassium on electroplax of *Electrophorus electricus*. J. cell. comp. Physiol. 49 1957 : 69-102 9 figs.

(Altukhov, K. A.). [Spawning grounds and the conditions of herring spawning in Kandalak Bay.] Vop. Ikhtiol. 9 1957 : 68-77 2 figs. [In Russian.]

Alverson, D. L. & Chatwin, B. M. Results from tagging experiments on a spawning stock of petrale sole, *Eopsetta jordani* (Lockington). J. Fish. Res. Bd. Can., 14 1957 : 953-974 3 figs.

Amano, K. *see* Tozawa, H.

Amatniek, E. *see* Mathewson, R.

Amlacher, E. Pathologische Histologie und Histochemie der Leber normaler und an infektiöser Bauchwassersucht erkrankter Karpfen (*K₂*). Arch. Fisch. Wiss. 9 : 97-134, 22 figs.

Ananiades, C. I. Lethal effects of chlordane on carps. Proc. Fish. Council. Mediterr. F.A.O. 4 1957 : 33-36.

Ancellin, J. Observations sur la faune et les fonds de pêche de quelques secteurs de la manche et des mers nordiques. Rev. Trav. Inst. Pêches marit. 21 1957 : 449-484.

Ancona, U. d'. Comparative biology of eels in the Adriatic and in the Baltic. Verh. int. Ver. Limnol. 13 : 731-735.

Anderson, A. W. & Power, E. A. Fishery statistics of the United States. Statist. Digest U.S. Fish. Wildl. Serv. Nos. 34 & 36 1955-56.

Anderson, J. M. *see* Guthrie, M. J.

Anderson, W. W. (1). Early development, spawning, growth and occurrence of the silver mullet (*Mugil curema*) along the South Atlantic coast of the United States. Fish. Bull. U.S. 57 1957 : 397-414 22 figs.

Anderson, W. W. (2). Larval forms of the fresh-water mullet (*Agonostomus monticola*) from the open ocean off the Bahamas and South Atlantic coast of the United States. Fish. Bull. U.S. 57 1957 : 415-425 9 figs.

Anderson, W. W. (3). Larval development, growth, and spawning of striped mullet (*Mugil cephalus*) along the South Atlantic coast of the United States. Fish. Bull. U.S. 58 : 501-519 22 figs.

Andreu, B. *see* Pinto, J. dos S.

Andrew, F. J. & others. An investigation of the problem of guiding downstream-migrant salmon at dams. Bull. int. Pacif. Salm. Fish. Comm. No. 8 1955 : 1-65 15 figs.

Andrew, F. J. *see* Hamilton, J. A. R.

Andrews, T. F. *see* Clarke, R. F.

Andriyashev, A. P. (1). [Fishes of the northern seas of USSR.] St. Petersburg 1954 : 1-566 300 figs.

(Andriyashev, A. P.) (2). [A gadid species (*Arctogadus glacialis* (Peters)) new to the fauna of the USSR caught at the drifting station "North Pole 6." Zool. Zh. 36 1957 : 1747-1749. [Russian with English summary.]

(Andriyashev, A. P.) (3). [Supplement to the review of the fishes of the genus *Lycenchelys* Gill with descriptions of three new species from the Kurile-Kamchatka Trench.] Vop. Ikhtiol 11 : 171-180 4 figs. [In Russian.]

Anthony, J. *see* Millot, J.

Antonaci, B. L. & Macagnino, G. L'indagine elettroforetica sulle sieroproteine in alcune specie animali. Monit. zool. ital. 65 1957 : 19-27 6 figs.

Antonini, E. *see* Marco, C. De.

Antonini, E. *see* Rossi-Fanelli, A.

Apelt, H. Die asiatischen Flugbarben. *Aquar. Terrar. Z.* **11** : 69-71 1 fig.

Apostolski, K. Fishing by means of "Naseki" on Dojran Lake. *Izd. Inst. Pisc. Macedoine* **2** : 83-101.

Applegate, V. C. & others. Use of monitrophenols containing halogens as selective sea lamprey larvicides. *Science* **127** : 336-338.

Arámburu, A. S. A. de. Nota sobre *Cyrtocharax squamosus* (Eigenmann y Kennedy) (Pisces: Characoida). *Notas Mus. La Plata* **19** 1957 : 87-92 2 figs.

Arbocco, G. Intorno all'apparato digerente dei Monacantidi (Pesci Pletto-gnati). *Bull. Zool.* **23** 1956 [1957] : 779-783 1 fig.

Arbocco, G. *see* Tortonese, E.

Arena, P. & Bolognari, A. Il corpo glomerulare del genere *Engraulis*. *Atti Soc. Peloritana* **3** 1957 : 243-251 1 pl. 1 fig.

Arim, N. *see* Demir, M.

Arndt, E. A. Histologische und histochemische Untersuchungen über die oogenese und bipolare Differenzierung von Süßwasser-Teleostern. *Protoplasma* **47** 1956 : 1-36 1 pl. 11 figs.

Arnold, D. C. Further studies on the behaviour of the fish *Carapus acus* (Brünnich). *Pubbl. Staz. zool. Napoli* **30** 1957 : 263-268.

Arnold, E. L. & Thompson, J. R. Offshore spawning of the striped mullet, *Mugil cephalus* in the Gulf of Mexico. *Copeia* **1958** : 130-132.

Arnoult, J. Sur quelques Poissons rares et peu connus des eaux douces de France. *Bull. Mus. Hist. nat. Paris* (2) **29** : 464-466.

Arnoult, J. & others. Les poissons de l'île Aldabra. Campagne océanographique de la Calypso (Mai-juin 1954). *Ann. Inst. Océanogr. Paris N.S.* **34** : 47-90 3 figs.

Aron, W. Cytological and histological notes on the hybrid of *Platichthys stellatus* × *Parophrys vetulus*, with notes on its backcross to *P. vetulus*. *Copeia* **1958** : 105-111 4 figs.

Aron, W. & McCrery, P. (1). A description of a new species of stomiatid from the North Pacific Ocean. *Copeia* **1958** : 180-183 1 fig.

Aron, W. & McCrery, P. (2). Descriptions of a new species of stomiatid and an unidentified leptocephalus. *Tech. Rep. Dep. Oceanogr. Univ. Wash. No. 58 Appendix* : 56-60 1 fig. [See also, Aron, W. & McCrery, P. (1) *Copeia* : 180-183.

Artüz, I. *see* Akyüz, E. F.

Asano, H. (1). Studies on the conger eels of Japan. I. Description of two new subspecies referable to the genus *Alloconger*. *Zool. Mag., Tokyo* **67** : 191-196 2 figs. [Japanese with English summary.]

Asano, H. (2). Studies on the conger eels of Japan. II. Description of two new fishes referable to the genera *Rhynchocymba* and *Promyallantor*. *Zool. Mag., Tokyo* **67** : 197-201 2 figs. [Japanese with English summary.]

Asano, H. (3). Studies on the congrid eels of Japan. III. Description of a new genus *Japanoconger* typed by *Arisoma sivicola* Matsubara and Ochiai, with consideration to the related genera. *Zool. Mag., Tokyo* **67** : 316-321 4 figs. [English summary.]

Asano, H. *see* Iwai, T.

(Assman, A. V.) (1). [Microorganisms as source of vitamins in food of fish fry]. *Vop. Ikhtiol.* **9** 1957 : 169-187 7 figs. [In Russian.]

Assman, A. V. (2). [On the role of microorganisms as a source of food for the young fish.] *Zool. Zh.* **36** 1957 : 900-908 2 figs. [Russian with English summary.]

Atkinson, G. T. Skippers on the shore. *Country Life* **123** : 465 1 fig.

Atz, J. W. (1). The peregrinating *Tilapia*. *Aquarist & Pondkpr.* **22** 1957 : 191-197 6 figs.

Atz, J. W. (2). How to confuse an ichthyologist. *Animal Kingdom* **60** 1957 : 114-116 3 figs.

Atz, J. W. (3). Now fishes come in plastic bags. *Anim. Kindg.* **61** : 27-28.

Atz, J. W. (4). A mouthful of babies. *Anim. Kindg.* **61** : 182-186.

Atz, J. W. *see* Pickford, G. E.

- Atz, J. W.** *see* Reid, M. J.
- Aubenton, F. d'** Sur *Chromeria nilotica* Boulenger 1901 (Poisson des eaux douces africaines). Répartition géographique et notes écologiques. Bull. Mus. Hist. nat. Paris (2) **30** : 68-70.
- Aubenton, F. d'** *see* Daget, J.
- Audouin, J. & Maurin, Cl.** Note sur la présence de poissons du genre *Salmo* dans le bassin occidental de la Méditerranée. Rev. Trav. Off. Pêches marit. **22** : 337-343 4 figs.
- Auerbach, M.** Hat die Schilddrüse für die Temperaturadaptation der Fische eine Bedeutung. Z. Fisch. N.F., **6** 1957 : 605-620 4 figs.
- Augustinsson, K.-B. & Johnels, A. G.** The acetylcholine system of the electric organ of *Malapterurus electricus*. J. Physiol. **140** : 498-500.
- Axelrod, H. R.** *see* Schultz, L. P.
- Azevedo, P. de.** Aclimação do "Black bass" na reprêsa de Americana. Bol. Industr. anim. N.S. **15** 1956 : 59-68 2 pls. 4 figs. [English summary.]
- Baalsrud, K.** Astaxanthin in the muscle of cod. Nature, Lond. **178** 1956 : 1182-1183 1 fig.
- (Babayan, K. E.).** [Caspian mullet.] Zool. Zh. **36** 1957 : 1505-1513. [In Russian with English summary.]
- Bacci, G. & Razzauti, A. (1).** False gonocorismo in *Coris julis* (L.). R.C. Accad. Lincei (8) **23** 1957 : 181-189 1 fig.
- Bacci, G. & Razzauti, A. (2).** Protogynous hermaphroditism in *Coris julis* L. Nature, Lond. **181** : 432-433 1 fig.
- Băcesco, M. & Dumitresco, H.** Les lagunes en formation aux embouchures du Danube et leur importance pour les poissons migrants. Verh. int. Ver. Limnol. **13** : 699-709 3 figs.
- Backiel, T. & others.** Ein Versuch zur Erhöhung der Fischproduktion auf biocönotischer Grundlage. Verh. int. Ver. Limnol. **13** : 748-753 1 fig.
- Baer, J. G.** Cours d'anatomie comparée des vertébrés. Neuchâtel (Griffon) 207 pp. 68 pls. col.
- Bagenal, T. B.** The fecundity of Clyde plaice. J. mar. Biol. Ass. U.K. **37** : 309-313 1 fig.
- Baggerman, B.** An experimental study on the timing of breeding and migration in the three-spined stickleback (*Gasterosteus aculeatus* L.). Arch. néerl. Zool. **12** Livr. 2 1957 : 105-317.
- Baginski, S.** Neuroglia of the carp's nervous system. Folia morph. Warszawa **6** 1955 : 85-94.
- Bahr, K.** Beiträge zur Fortpflanzungsbiologie des Flussneunauges *Petromyzon fluviatilis* L. Zool. Jb. Syst. **82** 1953 : 58-69 7 figs.
- Bailey, R. E.** The effect of estradiol on serum calcium, phosphorus, and protein of goldfish. J. exp. Zool. **136** 1957 : 455-469 3 figs.
- Bailey, R. M. (1).** Proposed use of the plenary powers to set aside in the interests of stability "First reviser" selections made for the generic name *Selene* Lacépède, 1803 and for the specific names *rostrata* Lesueur, 1817 (*Muraena*), *latipinna*, Lesueur, 1821 (*Mollienesia*), and *fuscus* Storer, 1839 (*Syngnathus*) (Class Pisces). Bull. zool. Nom. **13** 1957 : 303-308.
- Bailey, R. M. (2).** Request for a ruling determining the authorship to be attributed to the various portions of the work entitled *Histoire Naturelle des Poissons* written partly by Cuvier and partly by Valenciennes and published in the period 1828-1850. Bull. zool. Nom. **13** 1957 : 309-312.
- Bainbridge, R. (1).** The speed of swimming of fish as related to size and to the frequency and amplitude of the tail beat. J. exp. Biol. **35** : 109-133 16 figs.
- Bainbridge, R. (2).** The locomotion of fish. New Scient. **4** : 476-478 7 figs.
- Bainbridge, R. & Brown, R. H. J.** An apparatus for the study of the locomotion of fish. J. exp. Biol. **35** : 134-137 2 figs.
- Bainbridge, V.** Food of *Ethmalosa dorsalis* (Cuvier and Valenciennes). Nature, Lond. **179** 1957 : 874-875.
- Bairati, A.** Osservazioni preliminari sulla glia dei pesci. Monit. zool. ital. **63** 1955 : 309-315 3 pls. 1 fig.
- Baissac, J. de B.** Annual report of the Fisheries Branch for 1956. Ann. Rep. Mauritius No. **14** : 1-13 App. A-D.

Baker, K. F. (1). Heterotropic thyroid tissues in fish. II. The effect of iodine and thiourea upon the development of heterotropic thyroid tissue in platyfish. *J. exp. Zool.* **138** : 329-352 9 figs.

Baker, K. F. (2). Heterotropic thyroid tissues in fishes. *J. Morph.* **103** : 91-133, 18 figs.

Bal, D. V. & Mohmed, K. H. A systematic account of the eels of Bombay. *J. Bombay nat. Hist. Soc.* **54** 1957 : 732-740 14 figs.

Bal, D. V. *see* Marathe, V. B.

Balakrishnan, V. Occurrence of larvae of young mackerel (*Rastrelliger canagurta* Cuvier) off Vizhinjam, near Trivandrum. *Curr. Sci.* **26** 1957 : 57-58.

Balan, V. Notes on a visit to certain islands of the Laccadive Archipelago, with special reference to fisheries. *J. Bombay nat. Hist. Soc.* **55** : 297-306 map.

Baldwin, E. Ureogenesis in Elasmobranchs. *Nature, Lond.* **181** : 1591-1592.

Baldwin, W. J. *see* Rosenblatt, R. H.

Balon, E. (1). Růst Plotice (*Rutilus rutilus*). A revise hlavních metod jeho určování. Bratislava (Slovensk. Akad. Vied) 1955 : 124 pp. 41 pls. 35 figs.

Balon, E. (2). Die entwicklung des Huchen (*Hucho hucho* (L.)) während seiner endogener Ernährung nach dem Schlüpfen. Pol'nohosp. Landwirtschaft, Bratislava **3** 1956 : 433-455 21 figs. German summary.]

Balon, E. (3). Zwischenartige hybridisation von Donaufischen. I. Befruchtung der Eier des Donaubarsches mit der Milch des Zanders. Pol'nohosp. Landwirtschaft, Bratislava **3** 1956 : 581-592 8 figs. [German summary.]

Balon, E. (4). Age and growth of spawning shoal of the Danubian wild carp (*Cyprinus carpio* morpho *hungaricus* Heck.) from the smaller Danube above Kolarovo. Pol'nohosp. Landwirtschaft, Bratislava **4** 1957 : 961-986 15 figs. [English summary.]

Balon, E. (5). Contribution to the growth and biometry of larvae of the lamprey [*Lampraea planeri* (Bloch 1784)] from the river Lucina in Silesia. *Mém. Soc. zool. tchéosl.* **21** (3) 1957 : 193-202 4 figs.

Balon, E. (6). Die Entwicklung des Donauwildkarpfens (*Cyprinus carpio* L.) im Laufe der praelarvalen Phase und der larvalen Periode. *Biol. práce, Bratislava* **4** No. 6 : 1-54 37 figs. [German summary.]

Balon, E. (7). Die Entwicklung der Beschuppung des Donau-Wildkarpfens. *Zool. Anz.* **160** : 68-73 7 figs.

Balon, E. (8). Über die Entwicklungsstufen im Leben der Fische. *Biol. Zakl. Biol. Staw. Polsk. Akad. Nauk* No. 7 : 5-15 3 pls. [German summary.]

Bănărescu, P. (1). Contributions à l'étude de la faune ichthyologique d'eau douce de la République Populaire Roumaine. *Stud. Cercet. Acad. Române. Fil. Cluj* **4** 1953 : 153-187 10 figs. [French résumé].

Bănărescu, P. (2). Une espèce de poisson nouvelle pour les eaux de la R. P. Roumaine. *Leuciscus borys-thenicus* (Kessler). *Bul. Inst. Cercet. Pisc. Roman.* **13** No. 4 1954 : 59-60 1 fig.

Bănărescu, P. (3). Vergleichende Anatomie und Bedeutung der *Valvula cerebelli* der Knochenfische. *Rev. Biol. București* **2** 1957 : 255-276 61 figs.

Bănărescu, P. (4). Die rassiale Zugehörigkeit einiger rumänischer Susswasser-Fischarten. *Izd. Inst. Pisc. Macedoine* **2** : 59-81 1 chart.

Bănărescu, P. & others. Contribuțiuni la studiul raspindirii și ritmului de creștere al scobarului (*Chondrostoma nasus*) în bazinul Siretului. *Bul. Inst. Cercet. Pisc. Roman* **16** (3) 1957 : 49-58.

Bănărescu, P. *see* Dumitrescu, M.

Bardach, J. E. *see* Winn, H. E.

Banerjee, V. Morphology and coagulation time of the blood cells of *Heteropneustes fossilis* (Bloch). *Curr. Sci.* **26** 1957 : 58-59 1 fig.

Banner, A. H. & Boroughs, H. Observations on toxins of poisonous fishes. *Proc. Soc. exp. Biol. Med.* **98** : 776-778.

Barcellos, B. N. (1). Ictiofauna do Rio Grande do Sul. I. Sobre *Heptranchias perlo* (Bonnaterre, 1788). *Rev. bras. Biol.* **17** 1957 : 173-178 3 figs.

Barcellos, B. N. (2). Ictiofauna do Rio Grande do Sul. II. Sôbre *Alopias vulpinus* (Bonnaterre, 1788). Rev. bras. Biol. **17** 1957 : 531-536 1 fig.

Bargetsi, J. P. Application de méthodes d'analyse biochimique à une étude taxonomique: les corégones du lac de Neuchâtel. Cytologie et dosage de DNA. Experientia **14** : 445-447 2 figs.

Barlow, G. W. High salinity mortality of desert pupfish, *Cyprinodon macularius*. Copeia **1958** : 231-232.

Barnoud, R. see Cordier, D.

Barrett, J. H. & Yonge, C. M. Collins pocket guide to the seashore. London (Collins), pp. 272, 40 pls., text illust.

Barritt, W. C. see Russell, F. E.

Barrow, J. H. Social behaviour in fresh-water fish and its affect on resistance to trypanosomes. Proc. nat. Acad. Sci. Wash. **41** 1955 : 676-679.

(Barsukov, V. V.). [Fishes of Providence Bay and of the adjacent waters of the Chukotsk peninsula.] Trud. zool. inst. **25** : 130-163 11 figs. [In Russian.]

Bassot, J.-M. Caractères histochimiques des cellules glandulaires dans les organes lumineux du Téléostéen *Maurolicus pennanti* Walbaum. C.R. Acad. Sci. Paris **247** : 1909-1911.

Bassot, J. M. see Bauchot, M. L.

Bataller, J. R. La paleontologia y Luis Mariano Vidal. Bol. Inst. geol. Esp. **67** 1956 : (Pisces) 113-114, pls. xiii, xiv.

Battle, H. I. see Hisaoka, K. K.

Bauch, G. (1). Die Kleine Maräne (*Coregonus albula* L.) im Arendsee in der Altmark. Mitt. Naturk. u. Vorgesch. Magdeburg **3** 1953 : 109-140 10 figs.

Bauch, G. (2). Chemismus und Fischnährtierproduktion in den von der Kleinmaräne (*Coregonus albula* L.) bewohnten norddeutschen Gewässern. Abh. Ber. Naturk. u. Vorgesch. Magdeburg **10** 2 1956 : 15-36.

Bauch, G. (3). Untersuchungen über die Gründe für den Ertragsrückgang der Elbfischerei zwischen Elbsandsteingebirge und Boizenburg. Z. Fisch. **7** : 161-437 81 figs.

Bauchot, M.-L. & Bassot, J.-M. Sur *Heteroconger longissimus* Günther (Téléostéen Anguilliforme) et quelques aspects de sa biologie. Bull. Mus. Hist. nat. Paris (2) **30** : 258-261 1 fig.

Bauchot-Boutin, M.-L. Sur *Antennarius pinniceps* Commerson (Téléostéen Lophiiforme) et sa signification taxonomique. Bull. Mus. Hist. nat. Paris (2) **30** : 139-143.

Bauchot-Boutin, M. L. see Arnoult, J.

Bauer, K. Eine Meergrundel *Proterorhinus marmoratus* Pallas in Österreich. Aquar. Terrar. Z. **11** : 235-238 4 figs.

Bauer, O. Die Erforschung der Fischkrankheiten in den Sowjetteichwirtschaften und ihre Bekämpfung. Z. Fisch. **7** : 153-160.

(Bauer, O. N.) (1). [Conference on fish breeding in the inland water reservoirs of the German Democratic Republic.] Zool. Zh. **36** 1957 : 638-640. [In Russian.]

Bauer, O. N. (2). Biologie und Bekämpfung von *Ichthyophthirius multifiliis* Fouquet. Z. Fisch. **7** N.F. : 575-581.

(Bauer, O. N. & Uspenskaya, A. V.) [New methods of controlling fish diseases.] Conf. Diseases fish. 1957 : 13-14. [In Russian.]

Bauzá Rullán, J. (1). Nueva contribución al estudio de los otolitos de peces actuales y fósiles de España. Mem. Comun. Inst. geol. Barcelona **16** 1957 : 33-44 5 pls.

Bauzá Rullán, J. (2). Contribución al conocimiento del *Trigonodon oweni* Sismonda. Bol. Soc. esp. Hist. nat. Secc. Geol. **66** : 255-260 2 pls.

Bauzá Rullán, J. (3). Contribución al conocimiento de los otolitos de peces. Bol. Soc. esp. Hist. nat. Secc. Geol. **55** : 187-195 2 pls.

Baxter, E. W. Lamprey distribution in streams and rivers. Nature, Lond. **180** 1957 : 1145.

Baxter, I. G. see Bückmann, A.

Bayliff, W. H. see Salo, E. O.

Bauchamp, R. S. A. Utilizing the natural resources of Lake Victoria for the benefit of fisheries and agriculture. Nature, Lond. **181** : 1634-1635.

- Beaulieu, G.** *see* Vladyskov, V. D.
- Becker, E. L. & others.** Physiology of marine teleosts. I. Ionic composition of tissue. II. Hematologic observations. *Physiol. Zool.* **31** : 224-231 1 fig.
- Bell, F. H.** *see* Phillips, J. B.
- Beltan, L. (1).** Remarques concernant la variabilité du nombre des pariétaux chez le genre *Saurichthys*. *C.R. Acad. Sci., Paris* **247** : 1634-1636 2 figs.
- Beltan, L. (2).** Étude d'un neuro-crâne de *Lepidotes* du Bathonien du Maroc. *Bull. Soc. géol. Fr. (6)* **7** : 1091-1106 3 pls. 7 figs.
- Benl, G.** *Gyrinocheilus aymonieri* (Tirant) 1883, der "Algenfresser." *Aquar. Terrar. Z.* **11** : 33-37.
- Benl, G. & Chlupaty, P.** *Carinotetraodon*, eine neue Kugelfischgattung. *Aquar. Terrar. Z.* **10** 1957 : 227-229 figs. 1 and 2.
- Bennett, H. J.** *see* Cole, B. J.
- Benson, M. G.** Hermaphroditism in the cut-throat trout. *Copeia* **1958** : 239-240.
- Ben-Tuvia, A.** Pelagic fisheries in Israel. *Proc. Fish. Counc. Mediterr. F.A.O.* **4** 1957 : 383-391 1 fig.
- Berdeque, A. J. (1).** La pesqueria de la totoaba (*Cynoscion macdonaldi*) en San Felipe, Baja California. *Rev. Soc. mex. Hist. nat.* **16** 1955 : 45-78 3 figs., map.
- Berdeque, A. J. (2).** Biometric comparison of the anchoveta, *Cetengraulis mysticetus* (Günther), from ten localities of the eastern tropical Pacific Ocean. *Bull. Inter-Amer. Tuna Comm.* **3** : 1-76 17 figs.
- (Berdichevski, L. S.).** [The present state, and ways for increasing the stocks of the valuable economic fish in the water-reservoirs of the USSR.] *Vop. Ikhtiol.* **9** 1957 : 3-18. [In Russian.]
- Berg, L. S. (1).** [Lower Carboniferous fishes from the Achinsk Government.] *Vop. Ikhtiol.* no. 11 : 142-153 7 text-figs. [In Russian.]
- Berg, L. S. (2).** System der rezenten und fossilen Fischartigen und Fische. Translated from the 2nd Russian edition. *Deutschen Verh. Wissensch.* : xii + 310 pp.
- Berglund, C. O.** *see* Hoese, H. D.
- Berinke, L.** The taxonomical examination of the otoliths of the teleostean fishes of Hungary. *Ann. hist. nat. Mus. hung. N.S.* **8** 1957 : 401-412 4 pls.
- Bernatowicz, S.** Observations on the development of Ablen (*Coregonus albula* L.) in small water bodies. *Polsk. Arch. Hydrobiol.* **4 (17)** : 163-181 7 figs. [English summary.]
- Bernhauser, A.** Kann intravitaler Befall durch Bohrorganismen an fossilen Fischzähnen nachgewiesen werden? *S.B. öst. Akad. Wiss. Abt. I.* **165** 1956 : 383-396 10 figs.
- Berry, F. H. (1).** Additions to the fishes known from the vicinity of Cedar Key, Florida. *Quart. J. Fla. Acad. Sci.* **20** [1958] : 232.
- Berry, F. H. (2).** Additions to the fishes of Cedar Key, Florida, and a list of Gulf of Mexico Carangidae. *Quart. J. Fla. Acad. Sci.* **21** : 190.
- Berry, F. H. (3).** A new species of fish from the western North Atlantic *Dikellorhynchus tropidolepis* and relationships of the genera *Dikellorhynchus* and *Malacanthus*. *Copeia* **1958** : 116-125 13 figs.
- Berry, F. H. (4).** Age and growth of the gizzard shad, *Dorosoma lacepedi* (Lesueur), in Lake Newnan, Florida. *Proc. 11th Ann. Conf. S.E. Ass. Game Fish Comm.* : 318-331 6 figs.
- Berry, F. H. & Rathjen, W. F.** A new species of the boarfish genus *Antigonia* from the western Atlantic. *Quart. J. Fla. Acad. Sci.* **21** : 255-258 1 fig.
- Bersamin, S. V.** A preliminary study of the nutritional ecology and food habits of the chubs (*Leucichthys* spp.) and their relation to the ecology of Lake Michigan. *Pap. Mich. Acad. Sci.* **43** : 107-118 1 fig.
- Bertelsen, E. (1).** A new type of light organ in the deep-sea fish *Opisthoproctus*. *Nature, Lond.* **181** : 862-863 1 fig.
- Bertelsen, E. (2).** The Argentinoid fish *Xenophthalmichthys danae*. *Dana Rep. No.* **45** : 1-10 1 pl. 6 figs.

Bertelsen, E. & Marshall, N. B. Notes on Miripinnati (An addendum to Dana Report No. 42). A change of name and further records. Dana Rep. No. 42 Add. : 9-10 1 fig.

Bhargava, H. N. The development of the chondrocranium of *Mastacembelus armatus* (Cuv. & Val.). J. Morph. **102** : 401-426 20 figs.

Bhatti, H. K. & Islam, A. On the distribution of taste-buds in certain teleost fishes. Pakistan J. Sci. **3** 1951 : 78-81.

Bhownick, R. M. *see* Gupta, P. D.

Bidlingmayer, W. L. *see* Harrington, R. W.

Biely, N. D. (1). Intensity and efficacy of Zander nutrition. Rep. Acad. Sci. Ukr. No. 8 : 897-899.

Biely, N. D. (2). Growth of Zander during the first year of life in the Dnieper and closed water basins. Rep. Acad. Sci. Ukr. No. 9 : 1022-1026. [English summary.]

Bigelow, H. B. & Schroeder, W. C. (1). Four new rajids from the Gulf of Mexico. Bull. Mus. comp. Zool. Herv. **119** : 199-233 11 figs.

Bigelow, H. B. & Schroeder, W. C. (2). A large white shark, *Carcharodon carcharias*, taken in Massachusetts Bay. Copeia **1958** : 54-55.

Bigelow, H. B. *see* Taylor, C. C.

Biotocchi, M. *see* Moretti, G.

Bird, R. *see* Becker, E. L.

(Birman, I. B.). [On the distribution of some pelagic fishes in the northern part of the Pacific.] Zool. Zh. **37** : 1058-1062 fig. [In Russian with English summary.]

Bitners, I. *see* Idler, D. R.

Blackburn, M. The relation between the food of the Australian barracouta, *Thyrssites atun* (Euphrasen), and recent fluctuations in the fisheries. Aust. J. mar. & freshw. Res. **8** 1957 : 29-54 5 figs.

Blair, A. A. Counting fence of netting. Trans. Amer. Fish. Soc. **86** 1956 : 199-207. [also Studies Fish. Res. Bd. Can. 1957 FRB No. 492.]

Blanc, M. Sur quelques poissons des Iles Kerguelen rapportés par le Dr. Bourland. Bull. Mus. Hist. nat. Paris (2) **30** : 134-138.

Blaxter, J. H. S. & Holliday, F. G. T. (1). Herring (*Clupea harengus* L.) in aquaria. II Feeding. Mar. Res. Edinb. No. 6 : 1-22 4 figs.

Blaxter, J. H. S. & Holliday, F. G. T. (2). Factors influencing the feeding behaviour of herring. Proc. roy. phys. Soc. Edinb. **27** : 15-28 3 figs.

Blaxter, J. H. S. *see* Bückmann, A.

Blaxter, J. H. S. *see* Parrish, B. B.

Blažka, P. The anaerobic metabolism of fish. Physiol. Zool. **31** : 117-128 10 figs.

Bloomfield, D. K. *see* Lazarow, A.

Bocchi, G. D. & Mainardi, D. 'Le affinità' di *Cyprinus carpio* con alcune specie di ciprinidi studiate col metodo immunologico. R.C. Ist. lombardo **92B** : 379-383 2 figs.

Bodemer, C. W. (1). The origin and development of the extrinsic ocular muscles in the gar pike (*Lepisosteus osseus*). J. Morph. **100** 1957 : 83-111 24 figs.

Bodemer, C. W. (2). The origin and development of the extrinsic ocular muscles in the trout (*Salmo trutta*). J. Morph. **102** : 119-155 25 figs.

Boeseman, M. Sobre una colección de peces de la Republica de El Salvador. Comun. Inst. trop. Inv. Cient. **5** 1956 : 75-88 2 figs.

Bograd, L. *see* Perlmutter, A.

Bohl, H. Die Biologie der Kliesche (*Limanda limanda* L.) in der Nordsee. Ber. dtsh. Komm. Meeresforsch. **15** (1) 1957 : 1-57 27 figs.

Böhlke, J. E. (1). Substitute names for *Nystactes* Böhlke and *Lucaya* Böhlke, preoccupied. Copeia **1958** : 59.

Böhlke, J. E. (2). Results of the Catherwood Foundation Peruvian Amazon Expedition. The descriptions of two new Xenobryconine Characids. Copeia **1958** : 318-325 3 figs.

Böhlke, J. E. (3). Studies on fishes on the family Characidae.—No. 14. A report on several extensive recent collections from Ecuador. Proc. Acad. nat. Sci. Philad. **110** : 1-121 7 pls. 13 figs.

Böhlke, J. E. (4). Studies on fishes of the family Characidae No. 16.—A new *Hyphessobrycon* from Costa Rica. Bull. Fla. State Mus. Biol. Sci. **3** : 173-178 1 fig.

- Böhlke, J. E.** *see* Mead, G. W.
- Böhlke, J. E.** *see* Rechnitzer, A. B.
- Boisteanu, I.** *see* Jitariu, P.
- Bolognari, A.** *see* Arena, P.
- Bolster, G. C. & Bridger, J. P.** Nature of the spawning area of herrings. *Nature*, Lond. **179** 1957 : 638.
- Bopp, P.** Verhaltensstudien an Meergrundeln (Gobiidae) in Gefangenschaft. *Physiol. comp.* **4** 1957 : 247-269 14 figs.
- Boroughs, H. & Reid, D. F.** The role of the blood in the transportation of strontium 90—yttrium 90 in teleost fish. *Biol. Bull. Woods Hole* **115** : 64-73 4 figs.
- Boroughs, H. & others.** The metabolism of radionuclides by marine organisms. I. The uptake, accumulation, and loss of Strontium⁸⁹ by fishes. II. The uptake, accumulation and loss of Yttrium⁹¹ by marine fish, and the importance of short-lived radionuclides in the sea. *Biol. Bull. Woods Hole* **111** 1956 : 336-357 11 figs.
- Boroughs, H.** *see* Banner, A. H.
- Bose, B. B.** *see* Motwani, M. P.
- Bougis, P. & Mužinić, R.** Sur la croissance de *Mullus barbatus* (L.) dans les eaux de Split. *Acta adriat.* **8** No. 9 : 1-14 4 figs.
- Bougis, P. & Ruivo, M.** Contribution à la connaissance de la morphologique et de la thyroïde de *Bathypterois dubius* Vaillant. *Vie et Milieu. Suppl.* No. 6 1957 : 185-204 11 figs.
- Bouillon, J.** *see* Brien, P.
- Boulet, P. C.** La perception visuelle du mouvement chez la perche et la seiche. *Mém. Mus. Hist. nat. Paris N.S.* **17A** : 1-131 11 pls. 28 figs.
- Boutière, H.** Les scorpaenidés des eaux marocaines. *Trav. Inst. sci. Chérifien* No. 15 : pp. 84 5 pls.
- Boutière, H.** *see* Furnestin, J.
- Bowers, A. B.** Age and size of Manx herring in 1957. *Rep. Mar. biol. Sta. Pt. Erin.* No. 70 1957 (1958) : 17-20.
- Bradbury, M. G. & Cohen, D. M.** An illustration and a new record of the North Pacific bathypelagic fish *Macropinna microstoma*. *Stanf. ichthyol. Bull.* **7** : 57-59 1 fig.
- Brahma, S. K.** *see* Mookerjee, H. K.
- Brandhorst, W.** Über Laichen und Aufwuchs des Frühjahrsherings im Nord-Ostsee-Kanal. *Kieler Meeresforsch.* **12** 1956 : 186-199 4 pls.
- Brandon, A. M.** *see* Cordier, D.
- Branko, V. D.** Histological examination of sex glands of Salmonidae from the rivers in the region of the town of Livno and the upper reaches of the River Bosna. *Acta Ichthyol. Bosniae* **3** 1956 : 15-25.
- Branković, M. D.** Ribe Begeja i ribujaka "Ečka". *Bull. Mus. Hist. nat. Serb.* No. 10B 1957 : 1-7 map.
- Bratberg, E.** On the interpretation of the opaque and hyaline zones in the otoliths of immature redfish (*Sebastes marinus* L.). *J. Cons. int. Explor. Mer* **22** 1956 : 66-74 5 figs.
- Breder, C. M. & Campbell, M. L.** The influence of environment on the pigmentation of *Histrio histrio* (Linnaeus). *Zoologica, N.Y.* **43** : 135-144 3 pls.
- Brett, J. R. (1).** Salmon research and hydro-electric power development. *Bull. Fish. Res. Bd. Can.* No. 114 1957 : 1-26 2 figs.
- Brett, J. R. (2).** Implications and assessments of environmental stress. *Studies Fish. Res. Bd. Can.* 1957. FRB No [503].
- Brett, J. R. & Alderdice, D. F. (1).** Research on guiding young salmon at two British Columbia field stations. *Bull. Fish. Res. Bd. Can.* No. 117 1-75 34 figs.
- Brett, J. R. & Alderdice, D. F. (2).** The resistance of cultured young chum and sockeye salmon to temperatures below 0° C. *J. Fish. Res. Bd. Can.* **15** : 805-813 4 figs.
- Brett, J. R. & Ali, M. A.** Some observations on the structure and photomechanical responses of the Pacific salmon retina. *J. Fish. Res. Bd. Can.* **15** : 815-829 4 figs. 4 pls.
- Brett, J. R. & others.** The effect of temperature on the cruising speed of young sockeye and coho salmon. *J. Fish. Res. Bd. Can.* **15** : 587-605.
- Brett, J. R.** *see* Alderdice, D. F.
- Breukelman, J.** *see* Clarke, R. F.

Bridger, J. P. *see* Bolster, G. C.

Brien, P., Poll, M. & Bouillon, J. (1). Ethologie de la reproduction du *Protopterus dolloi* (Boulenger). Proc. XV Int. Congr. Zool. 76-78 (Sect. 1 No. 20: 1-3).

Brien, P., Poll, M. & Bouillon, J. (2). Une mission zoologique CEMUBAC au Stanley Pool (1957). Mém. Acad. Sci. colon. Bruxelles 8°, Cl. Sci. nat. méd. N.S. 7 No. 6: 1-39 7 pls. 6 figs.

Briggs, J. C. A list of Florida fishes and their distribution. Bull. Fla. St. Mus. (Biol. Sci.) 2: 223-318 3 figs.

Brongersma, L. D. The animal world of Netherlands New Guinea. Groningen (J. B. Walters): 1-71 34 figs.

Brooks, J. L. The species problem in freshwater animals. Publ. Amer. Ass. Adv. Sci. No. 50 1957: 81-123 11 figs.

Broussy, J. & Serfaty, A. Au sujet de la phosphatase alcaline du tube digestif chez les poissons téléostéens dulçaquicoles. Bull. Soc. zool. Fr. 83: 102-106 1 fig.

Brown, H. D. Cellular morphology of the annular ligament of the goldfish, *Carassius auratus*. J. Morph. 103: 255-274 5 pls. 3 figs.

Brown, J. L. Geographic variation in southeastern populations of the cyprinodont fish *Fundulus notti* (Agassiz) Amer. midl. Nat. 59: 477-488 4 figs.

Brown, P. K. & P. S. *see* Wald, G.

Brown, R. H. J. *see* Bainbridge, R.

Brunner, G. Nachtrag zur Breitenberghöhle bei Gösswein (Ofr.). Neues Jb. Geol. Paläont. Stuttgart 11: 500-517 15 text-figs.

Brunner, G. & others. Untersuchungen am Karpfen (*Cyprinus carpio* L.) über die Abhängigkeit des Vitamin A- und Carotinoidgehaltes von Entwicklung, Alter, Ernährung, Gesundheitszustand, Geschlecht und Beschuppungstyp der Fische. Arch. Fisch. Wiss. 9: 53-78 6 figs.

Brunson, R. B. & Block, D. G. The first report on the white sturgeon of Flathead Lake, Montana. Proc. Montana Acad. Sci. 17 1957: 61-62.

Bruno, A. F. & Nielsen, J. The freshwater fishes of Rennell Island. Nat. Hist. Rennell Is. 1: 221-226 1 fig.

Bückmann, A. & others. On herring "races." Rapp. Cons. Explor. Mer 143 (2): 1-158 6 pls. 59 figs. tabs.

Buen, F. de (1). Declinación de las poblaciones animales en aguas del litoral, preferentemente Moluscos y Crustáceos. Invest. zool. chil. 4 1957: 33-56 3 figs.

Buen, F. de (2). La familia Lepidotidae en Chile. Invest. zool. chil. 4: 132-134.

Buen, F. de (3). Ictiología: La familia Ictaluridae nueva para la fauna aclimatada de Chile y algunas consideraciones sobre los Siluroidei indígenas. Invest. zool. chil. 4: 146-158 1 fig.

Buen, F. de (4). Los grandes tiburones (*Cetorhinus* y *Rhincodon*) de la fauna marina de Chile. Invest. zool. Chil. 4: 201-207 2 figs.

Buen, F. de (5). Peces del suborden Scombroidei en aguas de Chile. Rev. Biol. mar. Valparaíso 7: 3-38 3 figs.

(Bugai K. S.). [On the reproduction of the Dnepr herring-carp (*Pelecus cultratus*) in connection with the regulation of the lower Dnepr flow.] Zool. Zh. 37: 1063-1074 graph. [In Russian with English summary.]

(Bukirev, A. I. & Pushkina, Z. M.). [Malformation in fishes.] Vop. Ikhtiol. 9 1957: 147-151 3 figs. [In Russian.]

(Bukirev, A. I. & Ussoltsev, E. A.). [On the history of ichthyofauna in the basin of the Kama.] Zool. Zh. 37 1958: 884-897 10 figs. [In Russian with English summary.]

Bullock, G. L. *see* Snieszko, S. F.

Burke, J. D. & Woolcott, M. S. A comparison of the blood oxygen capacity in the black crappie (*Pomoxis nigromaculata*) and the bluegill (*Lepomis macrochirus*). Virginia J. Sci. N.S. 8 1957: 113-120 1 fig.

Burnstock, G. A 'window' technique for observing fish viscera *in vivo*. Nature. Lond. 180 1957: 1491-1492 2 figs.

Burroughs, H. & others. Method for predicting amount of strontium-89 in marine fishes by external monitoring. Science 124 1956: 1027-1028.

Burton, P. R. A comparative osteological study of the skulls of the Moray eels, *Gymnothorax funebris* Ranzani and *Gymnothorax moringa* (Cuvier). Quart. J. Fla Acad. Sci. **19** 1956 : 35-44 7 figs.

Büskmann, A. Marine Fischerei-biologie und Allgemeine Meeresbiologie. Experientia **12** 1956 : 405-411.

Butcher, A. D. Poisonous and harmful fishes of Victoria. Fish Circ. Fish. Game Dept. Victoria No. 2 1957 : 1-7 7 figs.

Butz, E. & Kuenzer, P. Zur Brutpflege einiger Zwergcichliden. Z. Tierpsychol. **14** 1957 : 204-209 5 figs.

Buznikov, G. A. On the physiology of the hatching glands of embryo in Teleostei. J. gen. Biol., Moscow **18** 1957 : 350-359 6 figs. [English summary.]

Byczkowska-Smyk, W. Respiratory surface of the gills in teleosts. I. The respiratory surface of the gills in the flounder, *Pleuronectes platessa* and perch, *Perca fluviatilis*. Zool. polon. **8** 1957 [1958] : 91-111 13 figs.

Cable, L. E. Validity of age determination from scales and growth of marked Lake Michigan lake trout. Fish. Bull. U.S. **57** No. 107 1956 : 1-59.

Cadenat, J. (1). Note d'ichtyologie ouest-africaine. XIV-XVI. Bull. Inst. franç. Afr. N. **18A** 1956 : 1250-1271 9 figs.

Cadenat, J. (2). Notes d'ichtyologie ouest-africaine. XVII. Biologie. Régime alimentaire. Bull. Inst. franç. Afr. N. **19B** 1957 : 274-294.

Cadenat, J. (3). Notes d'ichtyologie ouest-africaine. XVIII. Un "diable de mer" du Pacifique est, *Mobula lucasana* Beebe et Tee Van 1938, sur les côtes du Sénégal. Bull. I.F.A.N. **20A** : 1427-1433 3 pls.

Cadenat, J. (4). A propos d'une morsure de requin. Notes afr. No. 73 1957 : 27-29 3 figs.

Cadenat, J. (5). Notes à propos du grand "requin marteau" *Sphyrna tudes*. Notes afr. No. 78 : 62-63 3 figs.

Cadenat, J. (6). Les diables de Mer. (Raies pélagiques de la famille des Mobulidae). Notes afr. No. 80 : 116-120 7 figs.

Cahn, P. H. Comparative optic development in *Astyanax mexicanus* and in two of its blind cave derivatives. Bull. Amer. Mus. nat. Hist. **115** : 73-112 16 pls. 11 tabs.

Caldwell, D. K. (1). The biology and systematics of the pinfish, *Lagodon rhomboides* (Linnaeus). Bull. Fla. St. Mus. Biol. Sci. **2** 1957 : 77-173 22 figs.

Caldwell, D. K. (2). Additional records of marine fishes from the vicinity of Cedar Key, Florida. Quart. J. Fla. Acad. Sci. **20** 1957 : 126-128.

Caldwell, D. K. (3). Fossil fish teeth of the family Sparidae from Florida. Quart. J. Fla Acad. Sci. **21** : 113-116 3 figs.

Caldwell, D. K. (4). A new fish of the genus *Ophioscion*, family Sciaenidae, from Caribbean Costa Rica. Quart. J. Fla Acad. Sci. **21** : 117-124 1 fig.

Caldwell, D. K. (5). Notes on the barred pattern in the sheepsheads, *Archosargus probatocephalus* and *A. oviceps*. Quart. J. Fla Acad. Sci. **21** : 138-144 1 fig.

Campbell, M. L. see Breder, C. M.

Campbell, R. N. The effect of flooding on the growth rate of brown trout in Loch Tummel. Sci. Invest. Freshwat. Fish., Edinb. **14** 1957 : 1-7.

Cantes, I. Contribution à la connaissance de la biologie du sprat (*Sprattus sprattus phalericus* (Risso)) de la région du littoral roumain. Hydrobiol., București **1** : 141-164 1 fig. [French summary.]

Carvalho, A. L. de (1). Notas para o conhecimento da biologia dos peixes anuais. Rev. bras. Biol. **17** 1957 : 459-466 8 figs.

Carvalho, A. L. de (2). The fish that spawns underground, *Cynolebias whitei*. Trop. Fish Hobbyist **7** No. 1 : 16-26 8 figs.

Carvalho, J. de P. (1). *Neopercis atlanticus meridionalis* n. subsp., percoforme da região leste meridional do Brasil (Pisces-Mugiloidei). Bol. Inst. oceanogr. S. Paulo **7** [1958] : 199-206 3 figs.

Carvalho, J. de P. (2). *Adenops dissimilis* n. sp., de peixe rei. (Fam.-Atherinidae-subfam. Menidiinae.) Bol. Inst. oceanogr. S. Paulo **7** [1958] : 93-103 1 pl.

Casasco, E. Sull'innervazione recettrice e vegetativa del labirinto membranoso dei teleostei. R.C. Accad. Lincei (8) **25** : 195-197 6 figs.

Casier, E. Les faunes ichthyologiques du Crétacé et du Cénozoïque de l'Angola et de l'Enclave de Cabinda. Comun. Serv. geol. Portugal **38** 1957 : 269-290.

Cassie, R. M. Condition factor of snapper, *Chrysophrys auratus* Forster, in Hauraki Gulf. N.Z. J. Sci. Tech. **38B** 1957 : 375-388 3 figs.

Castrejón, B. B. & Flores, I. S. Cambios producidos por la hipofisectomia en el sistema cromatósico de *Carassius auratus* L. An. Esc. nac. Cienc. biol. Mex. **8** 1955 : 203-210. [English summary.]

Čatić, D. The vitamins and food of the common trout and of the rainbow trout. Proc. Fish. Council. Mediterr. F.A.O. **4** 1957 : 421-426.

Cerf, J. A. see Otis, L. S.

Chabanaud, P. (1). Description d'un *Symphurus* inédit, fruit de la croisière 1899-1900 du Siboga. Beaufortia **5** 1957 : 183-185.

Chabanaud, P. (2). Etude d'une sole affectée d'une anomalie pigmentaire apparemment consécutive à un traumatisme. Bull. Soc. zool. Fr. **82** : 326-330 3 pls.

Chacko, P. I. & Mathew, M. J. A record of the sunfish, *Ranzania truncata* (Retzius), near Beypore, Malabar Coast. J. Bombay nat. Hist. Soc. **53** 1956 : 724-725 1 fig.

Chacko, P. I. see Menon, M. D.

Chaine, J. Recherches sur les otolithes des Poissons. Etude descriptive et comparative de la sagitta des Téléostéens (7e partie-4e fascicule). Bull. Centre Ét. Rech. sci. Biarritz. **1** 1957 : 463-557 7 pls.

Chandy, M. (1). *Plectropoma maculatum* Bloch in Indian Sea. Curr. Sci. **25** 1956 : 342.

Chandy, M. (2). Notes on the Indian flying fishes of the genus *Cypselurus* Swainson. Rec. Indian Mus. **52** 1956 : 177-184, 1 fig.

Charles, E. see Lewis, W. H.

Chatwin, B. M. see Alverson, D. L.

Chaudhuri, H. & Alikunhi, K. H. Observations on the spawning in Indian carps by hormone injection. Curr. Sci. **26** 1957 : 381-382.

Chavin, W. (1). Pituitary-adrenal control of melanization in xanthic goldfish, *Carassius auratus* L. J. exp. Zool. **133** 1956 : 1-45 5 pls. 2 figs.

Chavin, W. (2). Thyroid distribution and function in the goldfish, *Carassius auratus* L. J. exp. Zool. **133** 1956 : 259-279 2 pls. 14 figs.

Chavin, W. (3). Thyroid follicles in the head kidney of the goldfish, *Carassius auratus* (Linnaeus). Zoologica N.Y. **41** 1956 : 101-104 1 pl.

Chen, N.-S. & Shih, C.-F. Oxygen consumption of *Ctenopharyngodon idellus*, *Hypophthalmichthys molitrix* and *Aristichthys nobilis*. Acta zool. Sinica **7** 1955 : 43-58. [English summary.]

Chen, S. C. History of domestication and factors of varietal formation of the common goldfish, *Carassius auratus*. Acta zool. Sinica **6** 1954 : 89-116. [English summary.]

Chen, T. see Chu, K.

Cheng, W. L. see Chu, Y. T.

(Cheprakova, Yu. I.). [The structure and histogenesis of pharyngeal teeth in certain Cyprinidae.] C.R. Acad. Sci. URSS **121** : 920-923 7 figs. [In Russian..]

Chhappar, B. F. see Kewalramani, H. G.

Chiaffi, G. & Lutio, E. De. Il metabolismo del testosterone da parte di *Lebistes reticulatus* e di *Gambusia holbrooki*: Ricerche in vivo. R.C. Accad. Lincei (8) **23** : 316-319 1 fig.

Chiang, S.-C. see Nie, D.

Chieffi, G. see Adinolfi, M.

Chighigola, R. see Mouriquand, G.

Chimits, P. The Tilapias and their culture. Fish. Bull. FAO **10** 1957 : 1-24.

Chipman, W. A. & others. Uptake and accumulation of radioactive zinc by marine plankton, fish, and shellfish. Fish. Bull. U.S. **58** : 279-292 1 fig.

Chlupaty, P. see Benl, G.

Chopra, H. C. A morphological and histochemical study of the oocytes of the fish, *Ophiocephalus punctatus*, with particular reference to lipids. Quart. J. micr. Sci. **99** : 149-158 2 figs.

Chou, H. & Liu, H. Fossil fishes from Huanshan, Shensi. *Acta palaeont. Sinica* **5** 1957: 295-306 4 pls. figs. [Chinese with English summary.]

Chu, K. Y. A note to the echeineid fishes of Taiwan. *Quart. J. Taiwan Mus.* **10** 1 1957: 47-53.

Chu, K. & Chen, T. On the Rhynchoconger eels, with description of a new species. *Quart. J. Taiwan Mus.* **11**: 127-129 1 pl.

Chu, K. & Tsai, C. A review of the clupeid fishes of Taiwan, with description of a new species. *Quart. J. Taiwan Mus.* **11**: 103-125 3 pls.

Chu, Y. T. & Cheng, W. L. Description of two new species of carangoid fishes from the South Sea of China. *Acta zool. Sinica* **10**: 316-321. [In Chinese & English.]

(Chubareva, L. A.) (1). [Cytological and histo-chemical study of developing eggs of *Lampetra fluviatilis*.] *Vestn. Leningr. Univ. biol.* **9** 1957: 83-98 4 figs. [Russian with English summary.]

(Chubareva, L. A.) (2). [A cytological and cytochemical investigation of spermatogenesis in *Lampetra fluviatilis*.] *C.R. Acad. Sci. URSS* **121**: 165-168 pl. [In Russian.]

Čihař, J. (1). Systematical and biological notes on the pike, (*Esox lucius* L.). *Univ. Carol. Prag. 1 Biol.* **1** 1955: 1-18 3 figs. [English summary.]

Čihař, J. (2). Contribution to the knowledge of early development of the pike (*Esox lucius* L.). *Univ. Carol. Prag. 2 Biol.* 1956: 1-12 3 pls. [English summary.]

Čihař, J. (3). The food-biology of Crucian Carp. (*Carassius carassius* (L.) m. *humilis* Heckel 1840). *Mém. Soc. zool. tchéosl.* **21** 1957: 311-325 2 pls.

Čihař, J. & Frank, S. The food and the determination of age and rate of growth from scales of rudds (*Scardinius erythrophthalmus* (Linnaeus)). *Mém. Soc. zool. tchéosl.* **22**: 13-30 1 pl.

Clark, J. R. *see* Kohler, A. C.

Clarke, R. F., Breukelman, J. & Andrews, T. F. An annotated check list of the vertebrates of Lyon County, Kansas. *Trans. Kansas Acad. Sci.* **61**: 165-194.

Clavert, J. & Filogamo, G. (1). Sur la position du noyau de l'ovocyte et du plan de symétrie de l'embryon de *Lebistes reticulatus*. *C.R. Soc. Biol., Paris* **151**: 1740-1742 2 figs.

Clavert, J. & Filogamo, G. (2). Existence, chez *Lebistes reticulatus*, d'une rotation d'orientation de l'oeuf. *C.R. Soc. Biol., Paris* **151**: 2187-2189 1 fig.

Clavert, J. & Zahnd, J.-P. Réalisation expérimentale chez *Xiphophorus helleri*, de certaines modifications hépatiques qui s'observant au cours de la vitellogenèse de la phase de grand accroissement des follicules. *C.R. Soc. Biol., Paris* **151**: 1234-1236 3 figs.

Clementi, L. S. *see* Tolentino, A. R.

Clements, M. Proteolysis by the thyroid and other tissues of the male and female dogfish, *Scyliorhinus (Scyllium) canicula*. *J. exp. Zool.* **136** 1957: 249-258 3 figs.

Clos, F. & Serfaty, A. Activités cholinestérasiques chez les poissons dulçaquicoles. *Bull. Soc. Hist. nat. Toulouse* **92** 1957: 205-207.

Clothier, C. R. *see* Phillips, J. B.

Clutter, R. I. & Whitesel, L. E. Collection and interpretation of sockeye salmon scales. *Bull. int. Pacif. Salm. Fish. Comm. No. 9* 1956: 1-159 71 figs.

Coates, C. W. *see* Altamirano, M.

Coates, C. W. *see* Ray, C.

Cocco, F. Il differenziamento sessuale iniziale nel luccio (*Esox lucius*). *Atti Ist. Veneto Cl. Sci. Mat. e Nat.* **114** 1956: 139-152 3 pls.

Cocking, A. W. Relation between the ultimate upper lethal temperature and the temperature-range for good health in the roach (*Rutilus rutilus*). *Nature, Lond.* **180** 1957: 661-662.

Cohen, D. M. (1). Two new species of *Bathylagus* from the Western North Atlantic with notes on other species. *Breviora No. 98*: 1-9 2 figs.

Cohen, D. M. (2). A revision of the fishes of the subfamily Argentininae. *Bull. Fla. St. Mus. Biol. Sci.* **3**: 93 172 9 figs.

Cohen, D. M. (3). A nomenclatural discussion of the argentinid fish *Microstoma microstoma* (Risso) with new records from the eastern Pacific, and comments on the possible identity of the genus *Halaphya* Günther. Copeia 1958 : 133-134.

Cohen, D. M. (4). *Bathylychnops exilis*, a new genus and species of argentinoid fish from the North Pacific. Stanf. ichthyol. Bull. 7 : 47-52 5 figs.

Cohen, D. M. (5). *Nansenia candida*, a new species of argentinid fish from the North Pacific, with notes on other species of *Nansenia*. Stanf. ichthyol. Bull. 7 : 52-57 1 fig.

Cohen, D. M. see Bradbury, M. G.

Cohen, D. M. see Follett, W. I.

Cohen, S. B. Israel's salt water fisheries. Sea Frontiers 3 1957 : 224-237 8 figs.

Cole, B. J. & others. Tolerance of euryhaline fish forms to dilutions of oil field. Proc. La Acad. Sci. 20 : 13-23 1 fig.

Colket, T. C. see Russell, F. E.

Collignon, J. & others. Mollusques, Crustacés, Poissons marins des Côtes d'A.E.F., en collection au Centre d'Océanographie de l'Institut d'Études Centrafricaines de Pointe-Noire. Paris. (Office de la Recherche Scientifique et Technique Outre-Mer), 1957, pp. 369 text illust.

Constantiniu, R. see Nicolau, S. S.

Cooke, H. B. S. Observations relating to Quaternary environments in East and Southern Africa. Geol. Soc. S. Africa 60 (Annex.) No. 5 : 1-73 4 pls. 11 figs.

Cooperstein, S. J. see Lazarow, A.

Cope, O. B. Annotated bibliography on the cutthroat trout. Fish. Bull. U.S. 58 : 417-442.

Cope, O. B. & Slater, D. W. Role of Coleman hatchery in maintaining a king salmon run. Res. Rep. U.S. Fish. Serv. No. 47 1957 : 1-22 2 figs.

Coraboeuf, E. & Gargouil, Y.-M. Anesthésie au gaz carbonique et suppression réversible des effets de l'anesthésie à l'éthyle carbamate (uréthane) par le gaz carbonique chez la Rousette (*Scyliorhinus canicula*, Linné.) C.R. Acad. Sci., Paris 246 : 464-467.

Corbet, P. S. (1). Effects of *Simulium* control on insectivorous fishes. Nature, Lond. 181 : 570-571.

Corbet, P. S. (2). Some effects of DDT on the fauna of the Victoria Nile. Rev. Zool. Bot. afr. 57 : 73-95.

Corbin, P. G. A new British fish (*Gobius forsteri*). Nature, Lond. 181 : 1659.

Cordier, D. & M. Phosphorolyse du glycogène du muscle strié chez les poissons marins. C.R. Soc. Biol., Paris 151 : 1909-1911.

Cordier, D. & others (1). Étude sur la protéinémie de l'Anguille de mer (*Anguilla vulgaris* L.). Influence de jeûne et de l'asphyxie. C.R. Soc. Biol. Paris 153 : 783-786.

Cordier, D. & others (2). Influence du passage de l'eau douce à l'eau salée sur le taux de l'azote aminé et de l'azote non protéique du plasma chez la Tanche (*Tinca vulgaris*, L.). C.R. Soc. Biol. Paris 152 : 1147-1149.

Cordier, G. Recherches sur le taux du glycogène cardiaque chez les poissons marins. Influence de l'anoxie. C.R. Soc. Biol. Paris 151 : 1906-1908.

Cortot, H. & Rybak, B. Maintien prolongé de la contraction automatique du cœur entier isolé étalé ouvert d'Elasmobranches. C.R. Soc. Biol. Paris 151 : 1880-1881 2 figs.

Costanzo, C. J. di. Growth of bluegill, *Lepomis macrochirus*, and pumpkinseed, *L. gibbosus*, of Clear Lake, Iowa. Iowa St. Coll. J. Sci. 32 1957 : 19-34.

Conceiro, A. & others. Distribution de l'acétylcholinestérase dans les diverses régions des organes électriques de l'*Electrophorus electricus*. An. Acad. bras. Cienc. 30 : 75-81 3 figs.

Counts, R. C. see Ahlstrom, E. H.

Coupé, R. see Furnestin, J.

Courtenay, W. R. see Robins, C. R.

Cowper, T. R. New records of fishes from the South-eastern Australian continental slope. Pap. roy. Soc. Tasm. 92 : 149.

Cozens, A. B. A query on fish weights. Niger. Fld. 22 1957 : 182.

Craig, W. L. The shortnose spearfish *Tetrapturus angustirostris* Tanaka. A species new to the near shore fauna of the Eastern Pacific Ocean. Calif. Fish Game 44 : 275-280 2 figs.

Crawford, R. W. Behaviour, growth and mortality in the bluegill, *Lepomis macrochirus* Rafinesque, following fin clipping. *Copeia* 1958 : 330-331.

Creutzberg, F. Use of tidal streams by migrating elvers (*Anguilla vulgaris* Turt.). *Nature*, Lond. 181 : 857-858 1 fig.

Cristescu, M. see Necrasov, O.

Cross, F. B. & Hastings, C. E. Ages and sizes of 29 flathead catfish from the Kansas River, Douglas County, Kansas. *Trans. Kansas Acad. Sci.* 59 1956 : 85-86.

Cross, F. B. & Minckley, W. L. New records of four fishes from Kansas. *Trans. Kansas Acad. Sci.* 61 : 104-108.

Cross, F. B. see Greer, J. K.

Cuerrier, J. P. & Schultz, F. H. Studies of lake trout and common whitefish in Waterton Lakes, Waterton Lakes National Park, Alberta. *Wildl. Mgmt. Bull.* (3) No. 5 1957 : 1-41.

Curry-Lindahl, K. The occurrence of the char, *Salmo alpinus*, in running waters in Arctic and high boreal areas in Sweden. *K. fipogr. Sällsk. Lund Forh.* 27 1957 : 161-172 map.

Cushing, D. H. see Bückmann, A.

Czubak, W. & Zarnecki, S. Vergleich des Zuwachstempos von Karpfen aus verschiedenen Teichwirtschaften. *Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk.* No. 5 1957 : 25-52 14 figs. [Polish with German summaries.]

Czubak, W. see Zarnecki, St.

Daget, J. (1). Mémoires sur la biologie des poissons du Niger moyen. III. Reproduction et croissance d'*Heterotis niloticus* Ehrenberg. *Bull. Inst. franç. Afr. N.* 19B 1957 : 295-323 2 pls. 3 figs.

Daget, J. (2). Sur trois espèces de *Ctenopoma* (Poissons Anabantidae) de l'Ouest africain. *Bull. Inst. franç. Afr. N.* 20A : 539-561 text-figs. 1-5.

Daget, J. (3). Le genre *Paradistichodus* (Poissons Characiformes). *Bull. Inst. franç. Afr. N.* 20A : 1360-1378 text-figs. 1-12.

Daget, J. (4). Sur la présence de *Iorcus* cf. *docmac* (Poisson Siluriforme) dans le gisement néolithique saharien de Faya. *Bull. Inst. franç. Afr. N.* 20A : 1379-1386 pl. i text-figs. 1-4.

Daget, J. (5). Alevins de *Mormyrus rume* C. et V. *Bull. Soc. zool. Fr.* 83 : 200-204 3 figs.

Daget, J. (6). Deuxième Partie. Les Poissons, in Blanc, M. & Daget, J. Les eaux et les poissons de Haute-Volta. *Mém. Inst. franç. Afr. N.* No. 50, 1957 : 95-169 (Poissons 113-169 figs. 10-30).

Daget, J. & Aubenton, F. d'. Développement et morphologie du crâne d'*Heterotis niloticus* Ehr. *Bull. Inst. franç. Afr. N.* 19A 1957 : 881-936 31 figs.

Dahl, G. Two new annual cyprinodont fishes from northern Colombia. *Stanf. ichthyol. Bull.* 7 : 42-46.

Dalton, R. F. (1). Report on Dorset natural history for 1956. Vertebrates other than birds and mammals. *Proc. Dorset nat. Hist. Soc.* 78 1957 : 36.

Dalton, R. F. (2). Report on Dorset natural history for 1957. Vertebrates: Fishes. *Proc. Dorset nat. Hist. arch Soc.* 79 : 30-31.

Daniil'chenko, P. G. Dva novuikh vida ruib iz tretichnuikh otlozhenii Kavkaza. Materialui k osnovam paleontologhii. *Akad. Nauk SSSR.* 2 : 95-98, fig.

Danneel, R. Die ersten Melanoblasten de Neunaugenlarve. *Naturwissenschaften* 44 1957 : 46-47 3 figs.

Dannevig, E. H. Chemical composition of the zones in cod otoliths. *J. Cons. int. Explor. Mer* 21 1956 : 156-159.

(Dao Van Tien). [Rapport sur les recherches zoologiques dans le region de Vinh-Linh (province de Quang-Tri, Centre Vietnam.) *Zool. Zh.* 36 1957 : 1209-1216 fig. [In Russian with French summary.]

Dardignac, J. see Furnestin, J.

Darlington, P. J. Zoogeography; the geographical distribution of animals. New York, (John Wiley & Sons) 1957, pp. xi [2], 675, 78 figs.

Darnell, R. M. Food habits of fishes and larger invertebrates of Lake Pontchartrain, Louisiana, an estuarine community. *Publ. Inst. mar. Sci. Univ. Tex.* 5 : 353-416 17 figs.

(Das, S. M. & Moitra, S. K.). [On the variations in the digestive tract in connection with food of Indian freshwater fishes.] Ichthyol. Problems 10 : 29-409 figs. [In Russian.]

Das, S. M. & Saxena, D. B. Stages of transition in the afferent branchial arteries from fish to amphibian stage: a case of parallel evolution. Proc. nat. Acad. Sci. India 28B : 108-115 7 figs.

Davenport, D. & Norris, K. S. Observations on the symbiosis of the sea anemone *Stoichactis* and the pomacentrid fish, *Amphiprion percula*. Biol. Bull. Woods Hole 115 : 397-410.

David, A. see Motwani, M. P.

Davidson, T. Freezing the trout's lightning leap. Nat. geogr. Mag. 113 : 525-530 6 col. pls.

Davies, D. H. (1). The South African pilchard (*Sardinops ocellata*) and maasbanker (*Trachurus trachurus*): the predation of sea birds in the commercial fishery. Invest. Rep. Div. Fish. S. Afr., No. 31 : 1-16 5 figs.

Davies, D. H. (2). The South African pilchard (*Sardinops ocellata*) Preliminary report on the age composition of the commercial catches, (1950-55). Invest. Rep. Div. Fish. S. Afr. No. 33 : 1-20 7 figs.

Davis, W. S. Over production of American shad in Atlantic coast rivers. Res. Rep. U.S. Fish. Serv. No. 49 1957 : 1-5.

Dearolf, K. Survey of North American cave vertebrates. Proc. Pa Acad. Sci. 30 1956 : 201-210.

Deelder, C. L. (1). On the growth of eels in the IJsselmeer. J. Cons. int. Explor. Mer 23 1957 : 83-88 2 figs.

Deelder, C. L. (2). On the behaviour of elvers (*Anguilla vulgaris* Turt.) migrating from the sea into fresh water. J. Cons. int. Explor. Mer 24 : 135-146 4 figs.

Dehadrai, P. V. On the swim-bladder and its relation with the internal ear in genus *Notopterus* (Lacépède). J. zool. Soc. India 9 1957 : 50-61, 5 figs.

Demir, M. Migrations of *Sarda sarda* Bloch in the Black, Marmara, and Aegean Seas; the probable spawning places and time. Proc. Fish. Council. Mediterr. F.A.O. 4 1957 : 127-134.

Demir, M. & Acara, A. Research on the biology of mackerel (*Scomber scomber* L.) reasons for its migration spawning and distribution. Rapp. Comm. int. Mer Médit. 14 : 317-326 8 figs.

Demir, M. & Arim, N. Contribution to the biology of the mackerel (*Scomber scomber* L.). Proc. Fish. Council. Mediterr. F.A.O. 4 1957 : 135-139.

Demir, M. & others. About the sword-fish (*Xiphias gladius* L.). Proc. Fish. Council. Mediterr. F.A.O. 4 1957 : 141-142.

Denison, R. H. Early Devonian fishes from Utah. Part III Arthrodira. Fieldiana Geol. 11 : 459-551 11 figs.

Denizci, R. Some thoughts about the common grey mullet (*Mugil cephalus* L.) in the waters of Istanbul and its surroundings. Rapp. Comm. int. Mer Médit. 14 : 359-368 5 figs.

Denton, E. J. & Marshall, N. B. The buoyancy of bathypelagic fishes without a gas-filled swimbladder. J. mar. biol. Ass. U.K. 37 : 753-767 2 pls. 3 figs.

Desmarais, Y. Croissance et alimentation comparée de la truite du parc des Laurentides et de Rimonski. Nat. canad. 85 : 73-78.

de Silva, P. H. D. H. see Silva, P. H. D. H. de.

DeSylva, D. P. Juvenile blue marlin, *Makaira ampla* (Poey), from Miami, Florida, and West End, Bahamas. Bull. Amer. Mus. nat. Hist. 114 : 412-415.

DeSylva, D. P. see Krumholz, L. A.

Detlaff, T. Role of calcium ions in the processes taking place during fertilization and parthenogenetic activation in certain Acipenseridae. J. gen. Biol., Moscow 18 1 1957 : 3-16. [English summary.]

Deubler, E. E. A comparative study of the postlarvae of three flounders (*Paralichthys*) in North Carolina. Copeia 1958 : 112-116 2 figs.

Deubler, E. E. & Fahy, W. E. A reversed ambicolorate summer flounder, *Paralichthys dentatus*. Copeia, 1958 : 55.

Deubler, E. E. & Rathjen, W. F. Records of the flounder, *Chascanopsetta lugubris* Alcock, from the Western Atlantic. *Copeia* 1958 : 132-133.

Deufel, J. Untersuchungen über den Erreger der " Infektiösen Nierenschwellung und Leberdegeneration " der Forellen. *Arch. Fisch. Wiss.* 9 : 181-186.

Devillers, C. Problèmes d'origine et d'homologie des constituants du crâne dermique : 17-25. *Colloques Internat. C.N.R.S.* 60 Problèmes actuels de Paléontologie : 1-163 Paris 1956.

Devillers, C. & Rajchman L. Quelques données sur l'utilisation du vitellus au cours de la gastrulation dans l'oeuf de *Salmo irideus*. *C.R. Acad. Sci. Paris* 247 : 2033-2035.

de Zylva, E. R. A. Mechanization of fish craft and the use of improved fishing gear. *Bull. Fish. Res. Sta. Ceylon No. 7* : 1-25 21 figs. 1 map.

Dieuzeide, R. (1). Rapport sur les travaux récents d'ichthyologie méditerranéenne. *Rapp. Comm. int. Mer Médit.* 14 : 297-309.

Dieuzeide, R. (2). Les myxines (*Myxine glutinosa* L.) en Méditerranée. *Rapp. Comm. int. Mer Médit.* 14 : 371-372.

Dieuzeide, R. & Roland, J. (1). Prospections des fonds chalutables des Côtes Algériennes. Recherches de nouvelles zones (années 1956-1957). *Bull. Sta. Aquic. Pêche Castiglione* 9 : 10-69 9 figs.

Dieuzeide, R. & Roland, J. (2). Deuxieme complement au catalogue des poissons des Côtes Algériennes. *Bull. Sta. Aquic. Pêche Castiglione* 9 : 103-132 12 figs.

Dieuzeide, R. & Roland, J. (3). Etude biometrique sur les Centracanthidae du genre *Spicara* des Côtes Algériennes. *Bull. Sta. Aquic. Pêche Castiglione* 9 : 135-200 14 figs.

(Dik, V.). [Occurrence of *Thymallus thymallus* in Carpathian rivers.] *Priroda* 10 : 105-107 3 figs. [In Russian.]

Dimitriu, M. *see* Banarescu, P.

Dineen, C. F. *see* Hofstetter, A. M.

Dineen, C. F. *see* Peckham, R. S.

Dinu, R. Recherche sur la neuro-virose hydropigène epizootique des poissons (l'hydropsie infectieuse). *Stud. Cercet. Infarmacrobiol. Acad. Republ. rom.* 2 1951 : 43-52.

Dinulescu, G. *see* Nicolau, S. S.

Dixit, R. K. Germ cells and formation of oocytes in the ovaries of *Mystus seenghala* (Sykes) and *Wallago attu* (Bloch). *J. Asiat. Soc.* 22 1 1957 : 1-4 4 pls.

Doi, T. Dynamical treatment of exploitation of aquatic resources. III. Migration of the Pacific saury *Cololabis saira* (Brevoort). *Bull. Tokai Fish. Res. Lab. No. 20* : 13-21 8 figs. [English summary.]

Dollfus, R. P. (1). Première contribution à l'établissement d'un fichier ichthyologique du Maroc Atlantique de Tanger à l'embouchure de l'Oued Dra. *Trav. Inst. Sci. Cherifien Zool.* No. 6, 1955 : 1-226 1 map.

Dollfus, R. P. (2). Liste des parasites animaux du hareng de l'Atlantique Nord et de la Baltique. *J. Cons. int. Explor. Mer* 22 1956 : 58-65.

Dollfus, R. P. (3). Quelques poissons Téléostéens marins récemment entrés dans la collection de l'Institut scientifique chérifien. *C.R. Soc. Sci. int. Maroc.* 23 1957 : 113.

Domurat, J. Développement embryonnaire du brochet dans l'huile de paraffine. *Polak. Arch. Hydrobiol.* 5 (18) : 19-23. [French summary.]

Donaldson, L. R. & Allen, G. H. Return of silver salmon, *Oncorhynchus kisutch* (Walbaum) to point of release. *Trans. Amer. Fish. Soc.* 87 (1957) : 13-22 4 figs.

* Dorairajah, K. A. *see* Krishnamurthi, B.

Dôtu, Y. (1). The bionomics and life history of a gobioid fish, *Palaetogobius uchidai* Takagi. *Jap. J. ichthyol.* 6 1957 : 97-104 5 figs. [English summary.]

Dôtu, Y. (2). The bionomics and life history of two gobioid fishes, *Tridentiger undecircus* Tomiyama and *Tridentiger trigonocephalus* (Gill) in the innermost part of Ariake Sound. *Sci. Bull. Fac. Agric. Kyushu Univ.* 16 : 343-358 7 figs. [English summary.]

Dôtu, Y. (3). The bionomics and life history of the gobioid fish, *Ctenogobius dotui* Takagi. Sci. Bull. Fac. Agric. Kyushu Univ. **16** : 427-432 2 figs. [English summary.]

Dôtu, Y. & Mito, S. The bionomics and life history of the gobioid fish, *Luciogobius saikaiensis* Dôtu. Sci. Bull. Fac. Agric. Kyushu Univ. **16** : 419-426 1 pl. 1 fig. [English summary.]

Dôtu, Y. see Uchida, K.

Doualas, F. see Drilhon, A.

Doumenge, F. & Lahaye, J. Quelques nouvelles observations biométriques sur les thons (*Thunnus thynnus* L.) du Golfe d'Aigues-Mortes. Rapp. Comm. int. Mer Médit. **14** : 329-350.

(Dovgan, O. R.). [Morphology of Transcarpathian *Barbus*.] Nauch. Zap. Uzhgoral. Univ. **21** : 93-100 figs. [In Russian.]

Dragesund, O. Reactions of fish to artificial light, with special reference to large herring and spring herring in Norway. J. Cons. int. Explor. Mer **23** : 213-227 12 figs.

(Dragomirov, N. I.). [Larval development of Volga-Caspian sturgeon (*Acipenser guldenstädti* Brandt).] Trud. Inst. Morf. Zhiv. **20** 1957 : 187-231 8 pls. 5 figs. [In Russian.]

Drake, J. W. see Trinkaus, J. P.

Drewry, G. B. see Hubbs, Clark.

Dreyfus, E. see Viand, G.

Drilhon, A., Fine, J. N. & Doualas, F. Étude électrophorétique de quelques constituants sériques des poissons. Ann. Inst. oceanogr. Paris N.S. **35** : 141-158 2 pls. 3 figs.

Drilhon, A. see Fine, J.

Dryagin, R. A. [Biological principles of the reconstruction of the fish fauna in the lakes of the U.S.S.R.] Moscow, 1956 : 84 9 figs. [In Russian.]

Duarte-Bello, P. P. & Suarez-Caabro, J. A. *Chriodorus atherinoides*, nuevo reporte para la fauna ictiologica cubana. Monogr. Lab. Biol. mar., Habana Monogr. **2** 1957 : 1-3 1 fig.

Dudich, E. Die Grundlagen der Fauna eines Karpaten-Flusses. Acta zool., Budapest **3** : 179-200.

Due Rojo, A. Notas paleontológicas III. Fósiles vivos. Notas Inst. geol. Esp. **47** 1957 : 107-127.

Dumitresco, H. see Băcesco, M.

Dumitrescu, M. & others. *Romanichthys valsanicola* nov. gen. nov. sp. (Pisces, Percidae). Trav. Mus. Hist. nat. "Gr. Antipa" **1** 1957 : 225-244 14 figs.

Dunbar, C. E. see Wolf, K.

Duncan, D. W. see Idler, D. R.

Dunkle, D. H. Three North American Cretaceous fishes. Proc. U.S. nat. Mus. **108** : 269-277 3 pls.

Dupont, A. Pteridines in the scale of fishes. Naturwissenschaften **45** : 267-268.

Dutt, S. see Bückmann, A.

Dyk, V. (1). Die Äzeka [*Thymallus thymallus* (L.) 1758.] in verschiedenen Seehöhen der CSR der Karpatho-Ukraine SSSR. Biol. práce, Bratislava **4** No. 2 : 1-32 12 pls. 3 maps. [German summary.]

Dyk, V. (2). Modifikace zbarvení pstruhů obecných v Novém Štrbském plese. Biológia, Bratislava **13** : 906-910 2 figs.

Dyk, V. (3). Sommerstandorte einiger Fischarten in der Moravice. Prirod. Sborn. ostrav. Kraje **19** : 396-408 7 figs. [German summary.]

Dyszewska, L. & Markiewicz, F. Das Auftreten der Fische in dem Stau-becken bei Kozłowa Góra im Jahre 1953 und das Zuwachstempo einiger Gattungen. Biul. Zake. Biol. Staw. Polsk. Akad. Nauk No. 5 1957 : 53-70 6 figs. [Polish with German summaries.]

Dziekońska, J. Studies on early development stages of fish. II. The influence of some environment conditions on the embryonic development of bream (*Abramis brama* L.) in the Vistula Delta. Polsk. Arch. Hydrobiol. **4** (17) : 193-206.

Eaton, R. A fisherman's notebook. Field **211** : 1035.

Edel, V. see Mouriquand, G.

Edson, Q. A. see Phillips, J. B

Egami, N. (1). Appearance of the male character in the regenerating and transplanted rays of the anal fin in females of the fish *Oryzias latipes* following treatment with methyl-dihydrotestosterone. *J. Fac. Sci. Univ. Tokyo (Zool.)* 7 1954: 271-280 11 figs.

Egami, N. (2). Production of testis-ova in adult males of *Oryzias latipes* III. Testis-ovum production in starved males. *J. Fac. Sci. Univ. Tokyo (Zool.)* 7 1955: 421-428.

Egami, N. (3). Production of testis-ova in adult males of *Oryzias latipes* IV. Effect of X-ray irradiation on testis-ovum production. *J. Fac. Sci. Univ. Tokyo (Zool.)* 7 1955: 429-442.

Egami, N. (4). Notes on sexual difference in size of teeth of the fish, *Oryzias latipes*. *Jap. J. Zool.* 12 No. 1 1956: 65-69 7 figs.

Egami, N. (5). Production of testis-ova in adult males of *Oryzias latipes* VII. Seasonal changes of frequency of testis-ovum production. *Jap. J. Zool.* 12 No. 1 1956: 71-79 1 pl. figs.

Egami, N. & Ishii, S. Sexual differences in the shape of some bones in the fish *Oryzias latipes*. *J. Fac. Sci. Tokyo Univ. (Zool.)* 7 1956: 563-571.

Ege, V. *Omosudis* Günther, bathypelagic genus of fish. *Dana Rep. No.* 47: 1-19 3 figs.

Eguchi, H. & Kai, T. Studies on the fish culture food III. *Sci. Rep. Hokkaido Fish. Hatch. No.* 12 1957: 101-105. [Japanese.]

Eguchi, H. *see* Kai, T.

Einarsson, H. *see* Bückmann, A.

Eisler, R. (1). The influence of light on the early growth of Chinook salmon. *Growth* 21 1957: 197-203.

Eisler, R. (2). Some effects of artificial light on salmon eggs and larvae. *Trans. Amer. Fish. Soc.* 87 (1957): 151-162 5 figs.

Ekberg, D. R. Respiration in tissues of goldfish adapted to high and low temperatures. *Biol. Bull. Woods Hole* 114: 308-316.

(Elanidge, R. F.). [The Ichthyofauna of the river Rioni.] *Trud. Inst. Zool. Tiflis*, 15 1956: 111-168. [In Gruzian with Russian summary.]

Ellison, N. T. Further notes on the marine fishes of Cheshire and Liverpool Bay. *Northw. Nat. N.S.* 3 1956: 429.

Elson, P. F. (1). The importance of size in the change from parr to smolt in Atlantic salmon. *Canad. Fish. Cultur. No.* 21 1957: [1-6 sep. pag.] [also *Studies Fish. Res. Bd. Can.* 1957 FRB No. 506: 1-6.]

Elson, P. F. (2). Using hatchery-reared Atlantic salmon to best advantage. *Canad. Fish. Cultur. No.* 21 1957: [1-11 sep. pag.] [also *Studies Fish. Res. Bd. Can.* 1957 FRB No. 507: 1-11.]

Elson, P. F. (3). Number of salmon needed to maintain stocks. *Canad. Fish. Cultur. No.* 21 1957: [1-5 1 fig. sep. pag.] [also *Studies Fish. Res. Bd. Can.* 1957 FRB No. 508: 1-5 1 fig.]

Elson, P. F. (4). The role of hatcheries in assuring maritime stocks of Atlantic salmon. *Canad. Fish. Cultur.* 1957 No. 21: [1-8 sep. pag.] [also *Studies Fish. Res. Bd. Can.* 1957 FRB No. 509.]

Elwin, M. G. Pathological melanosis in an intergeneric hybrid. *Nature, Lond.* 179 1957: 1254-1255 1 fig.

Enami, M. (1). Studies in neurosecretion. VIII. Changes in the caudal neurosecretory system of the loach (*Misgurnus anguillicaudatus*) in response to osmotic stimuli. *Proc. Japan Acad.* 32 1956: 759-764 4 figs.

Enami, M. (2). Studies in neurosecretion. X. Occurrence of zinc in the caudal neurosecretory system of the eel. XI. Activity of an extract from the caudal neurosecretory system of the eel as tested upon the buoyancy of tailless and finless goldfish. *Proc. Japan Acad.* 34: 44-55 7 figs.

Enami, M. & Imai, K. (1). Studies in neurosecretion. VI. Neurohypophysis-like organisation near to caudal extremity of the spinal cord in several estuarine species of teleostei. *Proc. Japan Acad.* 32 1956: 197-200 3 figs.

Enami, M. & Imai, K. (2). Studies in neurosecretion. VII. Further observations on the caudal neurosecretory system and neurohypophysis spinalis (Urohypophysis) in marine teleosts. *Proc. Japan Acad.* 32 1956: 633-638 4 figs.

Enami, M. & Imai, K. (3). Studies in neurosecretion. XII. Electron microscopy of the secretory granules in the caudal neurosecretory system of the eel. *Proc. Japan Acad.* **34** : 164-168 3 figs.

Endo, T. *see* Matsue, Y.

Engelbrecht, H. Untersuchungen über den Parasitenbefall der Nutzfische in Greifswalder Bodden und Kleinen Haff. *Z. Fisch.* **7** N.F. : 481-511.

Enns, T. *see* Sundnes, G.

Entz, B. & Lukacsovics, F. Untersuchungen im Winterhalbjahr an einigen Balaton-See-Fischen zwecks Feststellung ihrer Ernährungs, Wachstums- und Vermehrungsumstände. *Ann. Inst. Biol. Tihany* **24** 1957 : 71-86. [German summary.]

(Erik, V. A.). [On the winter and spring races in *Lampetra fluviatilis*.] *Vop. Ikhtiol.* **9** 1957 : 142-143. [In Russian.]

Eristavi, M. S. Nizhneemelovaya fauna Ghruzii. Monog. Inst. Geol. Min. Akad. Nauk Gruz. SSR. **6** 1955 : 1-224 8 pls.

Eschmeyer, P. H. *see* Van Oosten, J.

Essex, C. D. & Shelton, J. H. Fish scales. *Food* : 438-441 42 figs.

Etienne, N. Actions des ions potassium, magnésium et calcium sur la fonction thyroïdienne de la truite arc-en-ciel (*Salmo irideus gairdnerii*). *C.R. Soc. Biol. Paris* **152** : 308-312.

Evans, L. T. & others (1). Lysergic acid diethylamide (LSD-25): XXVI Effect on social order of the fighting fish, *Betta splendens*. *J. Psychol.* **45** : 263-273.

Evans, L. T. & others (2). Effect of ergot drugs on *Betta splendens*. *Science, N.Y.* **123** 1956 : 26-28.

(Evropeitzeva, N. V.). [Transition from parr to smolt stage in salmon fry.] *Uchen. Zap. biol.* **44** 1957 : 117-154 9 figs. [In Russian.]

Exline, H. *see* Frizzell, D. L.

Fabricius, E. Hut abborren leker. *Zool. Revy* **18** 1956 : 48-55. [English summary.]

Fabricius, E. & Gustafson, K. J. Some new observations on the spawning behaviour of the pike, *Esox lucius* L. *Rep. Inst. Freshw. Res. Drottningh.* **39** : 23-54 11 figs.

(Fadeyev, N. S.). [On the type of spawning and fecundity of certain commercial flat-fishes of Sakhaline.] *Zool. Zh.* **36** 1957 : 1841-1847. [In Russian with English summary.]

Fahy, W. E. *see* Deubler, E. E.

Fairchild, M. D. *see* Russell, F. E.

Fänge, R. The structure and function of the gas bladder in *Argentina silus*. *Quart. J. micr. Sci.* **99** : 95-102 5 figs.

Fänge, R., & Johnels, A. G. An autonomic nerve plexus control of the gall bladder in *Myxine*. *Acta Zool., Stockh.* **39** : 1-8 3 figs.

Farkas, B. Zur Kenntnis der Struktur und Funktion der Otolithen. *Verh. dtsh. zool. Ges.* **1957** [1958] : 357-373 26 figs.

Faure, P. *see* Couceiro, A.

Feider, Z. & others. La surface branchiale chez le saurel de la Mer Noire. *An. Sti. Univ. Iasi N.S. (2)* **3** 1-2 1957 : 151-218 10 pls.

Feja, F. & Ljubica, N. Some data on the blood of carp from the Hutovo Blato. *Acta Ichthyol. Bosniae* **3** 1956 : 65-70.

Ferguson, R. G. The preferred temperature of fish and their midsummer distribution in temperate lakes and streams. *J. Fish. Res. Bd. Can.* **15** : 607-624.

Fernandez, A. & Martin, S. F. Apuntes sobre la ictiología de Perija. La Región de Perija y sus Habitantes, Caracas 1953 : 299-313 7 figs.

Fesolowicz, W. Investigations carried out on the stock of Pomerania Bay spring spawning herring in the years 1950-1954. *Prace morsk. Inst. ryback.* No. 9 1957 : 151-173 13 figs. [In Polish, English summary.]

Filogamo, G. *see* Clavert, J.

Fine, J. & Drilhon, A. Etude des protéines sériques de *Labrus bergyllta* par électrophorese de zone sur papier, gélose et gel d'amidon. *C.R. Acad. Sci. Paris* **246** : 3183-3186 1 fig.

Fine, J. M. *see* Drilhon, A.

Fisher, K. C. & Sullivan, C. M. The effect of temperature on the spontaneous activity of speckled trout before and after various lesions of the brain. *Canad. J. Zool.* **36** : 49-63 6 figs.

Fitch, H. S. Home ranges, territories, and seasonal movements of vertebrates of the natural history reservation. *Univ. Kans. Publ. Mus. nat. Hist.* **11** : 63-226 6 pls. 24 figs.

Fleming, R. H. The influence of hydrographic conditions on the behaviour of fish. (A preliminary literature survey). *Fish. Bull. F.A.O.* **9** 1956 : 181-196.

Flemming, H. Untersuchungen über die Bluteiweisskörper gesunder und bauchwassersuchtskranker Karpfen. *Z. Fisch.* **7** : 91-152 6 figs.

Flores, I. S. *see* Castrejón, B. B.

Foersch, W. Beobachtungen und Erfahrungen bei der Pflege und Zucht von *Cynolebias ladigesi* Myers. *Aquar. Terrar. Z.* **11** : 257-260 7 black and white and 1 colour-photo.

Follett, W. I. (1). Bronzed grackles feeding on emerald shiners. *Auk* **74** 1957 : 263.

Follett, W. I. (2). Fish remains from a shellmound in Marin County, California. *Amer. Antiquity* **23** 1957 : 68-71 2 figs.

Follett, W. I. (3). Fish remains from aboriginal sites in the Punta Penasco region of Sonora, Mexico. *Trans. San Diego Soc. nat. Hist.* **12** 1957 : 279-286 4 figs.

Follett, W. I. & Cohen, D. M. Request for a ruling as to the species to be accepted as the type species of the nominal genus *Bathylagus* Günther (A.C.L.G.), 1878 (Class Pisces). *Bull. zool. Nom.* **16** : 73-78.

Follett, W. I. *see* Hemphill, D. V.

Follett, W. I. *see* Vladykov, V. D.

Ford, P. Studies on the development of the kidney of the Pacific pink salmon *Onchorynchus gorboscha* (Walbaum). II. Variation in glomerular count of the kidney of the Pacific pink salmon. *Canad. J. Zool.* **36** : 45-47.

Ford, P. & Newstead, J. D. Studies on the development of the kidney of the Pacific pink salmon, *Oncorhynchus gorboscha* (Walbaum). I. The development of the pronephros. *Canad. J. Zool.* **36** : 15-21 2 pls.

Forrester, C. R. *see* Phillips, J. B.

Forsyth, D. C. T. The early development of pike. *J. Inst. Biol.* **3** No. 4 : 94-5 1956. [Abstract.]

(**Fortunatova, K. R.**). [Some data on the effect of the predators upon the size of fish population.] *Zool. Zh.* **36** 1957 : 575-586 7 graph. [In Russian with English summary.]

Fortune, P. Y. The effect of temperature changes on the thyroid-pituitary relationship in teleosts. *J. exp. Biol.* **35** : 824-831 1 pl.

Foskett, D. R. The Rivers Inlet sockeye salmon. *J. Fish. Res. Bd. Canada* **15** : 867-889 8 figs.

Foskett, D. R. & Jenkinson, D. W. Contributions to the life history of the sockeye salmon. *Rep. B.C. Dep. Fish.* 1956 : K25-K44 [also *Stud. Fish. Res. Bd. Can.* 1957 FRB No. 501.]

Fowler, H. W. (1). Some new or emended names of fish-like vertebrates. *Fish. Cult.* **30** No. 10 Suppl. 1951 : 1-4.

Fowler, H. W. (2). A synopsis of the fishes of China. Pt. VIII. The Blennioid and related fishes. *Quart. J. Taiwan Mus.* **11** : 147-339 47 figs.

Franca, P. da. Contribuição para o conhecimento dos Stromateidae de Angola. *An. Jta Invest. Ultramar, Lisbon* **12** Tom. 2 : 7-26 2 pls. 1 fig.

Franca, P. da & M. de L. (1). Contribuição para o conhecimento da biologia de *Gambusia holbrooki* (Girard) aclimatada em Portugal. *Arch. Mus. Bocage* **25** 1954 : 39-87.

Franca, P. da & M. de L. (2). Observações osteológicas em *Gambusia*. Esqueleto axial. *Arch. Mus. Bocage* **26** 1955 : 127-156 16 pls.

Franca, P. da & M. de L. (3). Observações osteológicas em *Gambusia*. *Arch. Mus. Bocage* **27** 1956 : 31-54 11 pls.

Frank, S. (1). The food of common bullhead (*Ameiurus nebulosus* Le Sueur 1819) in the Labe (Elbe) region. *Univ. Carol. Prag. 1 Biol.* (1) 1955 : 19-24. [English summary.]

Frank, S. (2). The reproductive habits and the postembryonal development of the white bream (*Blicca bjoerkna* [Linné] 1758). Univ. Carol. Prag. 2 Biol. (1) 1956 : 13-38 7 pls. [English summary.]

Frank, S. (3). Alter und Wachstum des Flussbarsches (*Perca fluviatilis* Linné) in Böhmen. Mém. Soc. zool. tchécosl. 22 : 45-58.

Frank, S. (4). Zweiter Fund der goldenen Aberation der Bartgrundel (*Nemachilus barbatulus* aberr. *erythrina* Berg 1933) in der Tschechoslowakei. Mém. Soc. zool. tchécosl. 22 : 199-202 2 figs.

Frank, S. see Cihar, J.

Fremont-Smith, N. see Evans, L. T.

Fridriksson, A. Langförl Nordur-landssild. Náttúrufræðingurinn 28 : 96-98 1 fig. [English summary.]

Fridriksson, A. see Bückmann, A.

(Friedland, I. G.). [Effect of the augmented mineralization of water on the growth and development of Carp in Proletarsky water reservoir.] Zool. Zh. 36 1957 : 1514-1520. [In Russian with English summary.]

Fries, E. F. B. Iridescent white reflecting chromatophores (antagophores, iridoleucophores) in certain teleost fishes, particularly in *Bathygobius*. J. Morph. 103 : 203-242 5 pls.

Friese, U. E. *Nothobranchius guentheri* (Pfeffer) Aquar.-Terrar. Z. 11 : 1-3.

Friz, C. T. see Lazarow, A.

Frizzell, D. L. & Exline, H. Fish ossiculiths: Unrecognized microfossils. Micropaleontology 4 : 281-285 figs.

Frost, W. E. First record of the elver of the African eel *Anguilla nebulosa labiata* Peters. Nature, Lond. 179 1957 : 594.

Frost, W. E. & Le Cren, E. D. The occurrence of some fishes in the Lake District. Changing Scene No. 11957 : 38-39.

Fry, D. H. see Phillips, J. B.

Fujimoto, M. Ecological studies on the land-locked Ayu (*Plecoglossus altivelis* T. et S.) propagated in Koyagawa Dam (Lake Toyota) in Yamaguchi Prefecture I. J. Shimonoseki Coll. Fish. 7 (1) 1957 : 179-183 2 figs.

Fujita, S. (1). On the egg development and prelarval stage of a damselfish, *Chromis notatus* (Temminck & Schlegel). Jap. J. Ichth. 6 1957 : 87-90 13 figs. [English summary.]

Fujita, S. (2). On the larval stages of a scorpaenid fish, *Sebastes pachycephalus nigricans* (Schmidt). Jap. J. Ichth. 6 1957 : 91-93 3 figs. [English summary.]

Fujita, S. (3). On the egg development and larval stages of a viviparous scorpaenid fish, *Sebastes oblongus* Gunther. Bull. jap. Soc. sci. Fish. 24 : 475-479 12 figs.

Fukada, H. On the blood sugar of freshwater fish. Bull. jap. Soc. sci. Fish., 23 : 782-784. [Japanese with English summary.]

Fukano, K. G. & Hooper, F. F. Toxaphene (chlorinated camphene) as a selective fish poison. Progressive Fish Culturist, Oct. : 189-190.

Furnestin, J. & Vincent, A. Variation des branchiospines dans le genre *Alosa*. C.R. Acad. Sci. Paris 246 : 3376-3379.

Furnestin, J. & others. Données nouvelles sur les poissons du Maroc atlantique. Rev. Trav. Off. Pêches marit. 22 : 381-487 75 figs.

Fuse, S. see Okuno, R.

Gadidov, N. see Ionescu, N.

Gagnon, A. La toxicité du DDT pour le saumon de l'Atlantique (*Salmo salar* Linné) et les alevins de truite (*Salvelinus fontinalis* Mitchell). Canad. J. Zool. 36 : 479-487 3 figs.

Gamulin, T. & Karlovac, J. Recent data concerning the distribution of sardine (*Sardina pilchardus* Walb.) eggs on a spawning ground of the central Adriatic. Proc. Fish. Counc. Mediterr. F.A.O. 4 1957 : 219-226 5 figs.

Ganapati, P. N. & Rao, K. S. On the bionomics of *Sardinella gibbosa* (Blkr) off Waltair Coast. J. zool. Soc. India 9 1957 : 162-182 5 figs.

Ganguly, D. N. see Mookerjee, H. K.

Gargouil, Y. M. see Coraboeuf, E.

Garrrick, J. A. E. Further notes on the affinities of *Arhynchobatis asperimus* Waite with other Rajoids, and data on a fourth specimen. Trans. R. Soc. N.Z. 85 1957 : 201-203.

Garrod, D. J. & Newell, B. S. Ring formation in *Tilapia esculenta*. *Nature*, Lond. **181** : 1411-1412.

Garside, E. T. & Tait, J. S. Preferred temperature of rainbow trout (*Salmo gairdneri* Richardson) and its unusual relationship to acclimation temperature. *Canad. J. Zool.* **36** : 563-567 1 fig.

Gasowska, M. The morphology of hybrids and the ways of inheriting parental features by reciprocal hybrids: Whitefish \times small whitefish (*Coregonus lavaretus maraenoides* Poljakov \times *C. albula* L.). *Polsk. Arch. Hydrobiol.* **4** (17) : 277-287 6 figs.

Gastaud, J. M. (1). De quelques méthodes d'études du système vasculaire chez les poissons. *Rapp. Comm. int. Mer Médit.* **13** 1956 : 249-251 3 figs.

Gastaud, J. M. (2). Caractères anatomiques et histologiques des canaux de Müller chez *Scyliorhinus canicula* L. pendant la croissance et l'ovulation. *C.R. Soc. Biol. Paris* **152** : 984-987 2 figs.

Geiger, W. Quantitative Untersuchungen über das Gehirn der Knochenfische, mit besonderer Berücksichtigung seines relativen Wachstums. *Acta Anat.* **27** 1956 : 324-350 13 figs. [English summary.]

Geiser, W. Aufzucht von *Tetraodon lineatus brevirostris*. *Aquar. Terrar. Z.* **11** : 100-101 1 fig.

Gelineo, S. (1). Activité spontanée des poissons de mer et consommation d'oxygène à la température d'adaptation de 12°5 C. *C.R. Soc. Biol., Paris* **151** : 1239-1241.

Gelineo, S. (2). Le taux de l'hémoglobine sanguine de plusieurs espèces de poissons de mer. *C.R. Soc. Biol., Paris* **151** : 1594-1597.

Gelineo, S. (3). Activité des poissons de mer et concentration d'hémoglobine. *Glas srpsk. Akad. Nauka* No. 231 : 9-16. [French summary.]

Gelineo, S. (4). Le rythme nycthérméral de métabolisme chez *Scorpaena scrofa* (L.). *Glas srpsk. Akad. Nauka* No. 231 : 33-36. [French summary.]

Gelineo, S. (5). Température d'adaptation et consommation d'oxygène chez la scorpière truie-*Scorpaena porcus* L. *Glas srpsk. Akad. Nauka* No. 231 : 55-60. [French summary.]

Genovese, S. Dattii biometrii sul tonno (*Thunnus thynnus* L.) Tirrenico. *Rapp. Comm. int. Mer Médit.* **14** : 327-328.

George, M. G. On the swim-bladder of *Anabas testudineus* (Bloch). *Curr. Sci.* **26** 1957 : 398-399 1 fig.

(Gerasimov, V. V.). [On so called "Calanus loving" herring.] *Trud. Murman. biol. Sta.* **3** 1957 : 111-113. [In Russian.]

Gerbilskii, N. L. (1). Intraspecific biological groups of acipenserines and their reproduction in the lower regions of rivers with regulated flow. *Syst. Zool.* **4** 1955 : 86-92.

(Gerbilskii, N. L.) (2). [Second variant in pond breeding of sturgeon fry.] *Uchen. Zap. biol.* **44** 1957 : 94-102. [In Russian.]

Gerbilskii, N. L. (3). The biological differentiation in limits of species and its significance for the species in the world of fishes. *Vestn. Leningr. Univ.* No. 21 1957 : 82-92. [Russian with English summary.]

Gerking, S. D. A history of the study of fishes in Indiana. *Proc. Ind. Acad. Sci.* **66** 1957 : 275-285.

Geronimus, L. H. *see* Evans, L. T.

Gervers, F. W. K. *see* Slack, H. D.

Géry, J. Notes d'aquariologie ouest-africaine. XI—A propos du genre *Barbus*. *L'Aquarium* **7** 1957 nos. 5-6 : 5-32 text-figs. 1-22.

Geus, A. Unbekannte Nematodenlarven bei *Monocirrhus polyacanthus*. *Aquar. Terrar. Z.* **11** : 122-123 figs.

Ghelardoni, R. Resti fossili di pesci nel livello a *Purpura* delle sablisse di Torre del Lago (Viareggio). *Atti Soc. tosc. Sci. nat.* **63A** 1955 : 33-40 2 pls.

Ghenin, D. I. On certain peculiar features in the fertilization of viviparous fish. *J. gen. Biol., Moscow* **17** 1956 : 473-478 8 figs. (See separate summary.)

Gheorghe, V. Récentes recherches sur les vitamines A et D du foie de certains poissons et mammifères marins. *Bul. Inst. Cercet. Pisc. Roman.* **13** No. 4 1954 : 51-58.

Ghirardelli, E. Su di un esemplare di *Platichthys flesus italicus* (Günther) anomalo. *Doriana* **2** (90) : 1-5 1 pl.

Giaja, J. & Marković-Giaja, L. (1). De la fatigue des poissons. Bull. Acad. serbe Sci. math. nat. N.S. **18** Sci. nat. **5** 1957 : 57-58.

Giaja, J. & Marković-Giaja, L. (2). La fatigue des poissons. C.R. Soc. Biol., Paris **151** : 1204-1205.

Gibbs, R. H. (1). Preliminary analysis of the distribution of white marlin, *Makaira albida* (Poey), in the Gulf of Mexico. Bull. mar. Sci. Gulf and Caribbean **7** 1957 : 360-369 2 figs.

Gibbs, R. H. (2). Cyprinid fishes of the subgenus *Cyprinella* of *Notropis*. II. Distribution and variation of *Notropis spilopterus*, with the description of a new subspecies. Lloydia **20** 1957 : 186-211 4 figs.

Gibbs, R. H. see Mather, F. J.

Gibbs, S. P. The anatomy and development of the buccal glands of the lake lamprey (*Petromyzon marinus* Linnaeus) and the histochemistry of their secretion. J. Morph. **98** 1956 : 429-462 3 pls.

Gühr, M. Zur Entwicklung des Hechtes. Rev. suisse Zool. **64** 1957 : 355-474 63 figs.

Gilbert, P. W. & Wood, F. G. Method of anesthetizing large sharks and rays safely and rapidly. Science **126** 1957 : 212-213 2 figs.

Gilch, G. Vergleichende Untersuchungen eines hydrostatischen Apparatus larvaler Labyrinthfische. Zool. Jb. (Anat.) **76** Hft 1 1957 : 1-62 75 figs.

Gilis, C. see Bückmann, A.

Godfrey, H. (1). Feeding of eels in four New Brunswick salmon streams. Progr. Rep. Atl. biol. Sta. No. 67 1957 : 19-22.

Godfrey, H. (2). A comparison of sockeye salmon catches at Rivers Inlet and Skeena River, B.C., with particular reference to age at maturity. J. Fish. Res. Bd. Can., **15** : 331-354 11 figs.

Godfrey, H. (3). Comparisons of the index of return for several stocks of British Columbia salmon to study variations in survival. J. Fish. Res. Bd. Canada **15** : 891-908 3 figs.

Godoy, M. P. de. Marcação de peixes no Rio Mogi Guaçu. (Nota previa). Rev. bras. Biol. **17** 1957 : 479-490 8 figs.

(Gogol, V. A.). [Systematic characters of *Gambusia* acclimatized in Uzbekistan.] Zool. Zh. **36** 1957 : 459-462. [In Russian with English summary.]

Gokhale, S. V. Operation of the Dol net off the Saurashtra coast. J. Bombay nat. Hist. Soc. **54** 1957 : 714-725 7 figs.

Gomes, A. L. & Schubart, O. Descrição de "*Chasmocranus brachynema*" sp. n., novo "Luciopimelodinae" da Bacia do Rio Mogi Guaçu, estado de São Paulo. (Pisces, Nematognathi, Pimelodidae). Rev. Bras. Biol. **18** : 413-416 1 fig.

(Goncharov, A. I.). [First examination of carp farming in Kirgizic.] Trud. Inst. Zool. Parasit. Frunze **6** 1957 : 45-59. [In Russian.]

Goodall, R. G. see Hoar, W. S.

Gordon, B. L. The homing eel, marvel of instinct. Frontiers **23** : 14-16.

Gordon, M. (1). An intricate genetic system that controls nine pigment cell patterns in the platyfish. Zoologica, N.Y. **41** 1956 : 153-162 1 pl.

Gordon, M. (2). The drifting leaf that is a fish. Anim. Kingd. **60** 1957 : 151-154 4 figs.

Gordon, M. (3). Hitch-hiking discus babies. Anim. Kingd. **60** 1957 : 169-176 6 figs.

Gordon, M. (4). Biology and the fish fancier. Nat. Hist. N.Y. **67** : 20 25 figs.

Gordon, M. see Greenberg, S. S.

Gordon, M. see Kallman, K. D.

(Goryunova, A. I.) (1). [Formation of fish fauna in the Dzhetskagansk water reservoir.] Sborn. Rabot. Ikhtiol. Ghidrobiol. **1** 1956 : 31-73. [In Russian.]

(Goryunova, A. I. (2). [The problem of teratology in Carp.] Sborn. Rabot. Ikhtiol. Ghidrobiol. **1** 1956 : 261-268. [In Russian.]

Gosline, W. A. Central Pacific eels of the genus *Uropterygius*, with descriptions of two new species. Pacif. Sci. **12** : 221-228 2 figs.

Goss, R. J. The role of the central cartilaginous rod in the regeneration of the catfish taste barbel. J. exp. Zool. **127** 1954 : 181-199 14 figs.

Goss, R. J. & Stagg, M. W. The regeneration of fins and fin rays in *Fundulus heteroclitus*. J. exp. Zool. **136** 1957 : 487-507 12 figs.

Gottschalk, C. Eine häufige Anomalie des mandibularen (1) Aortenbogens bei *Lebistes reticulatus* Peters unter Berücksichtigung der normalen Entwicklung. Anat. Anz. **102** 1955 : 96-101 4 figs.

Graham, H. W. see Taylor, C. C.

Graham, J. F. G. Some observations on the schooling movements of the alewife in Lake Ontario. Canad. Fld. Nat. **71** 1957 : 115-116.

Graham, J. J. Observations on the alewife, *Pomolobus pseudoharengas* (Wilson), in fresh water. Univ. Toronto Biol. Ser. No. 62 1956 : 1-43 20 figs.

Grangaud, R. & Moatti, J. P. Néof ormation de vitamine A2 chez *Gambusia holbrooki* Grd., après administration de B-carotène ou de vitamine A₂. C.R. Soc. Biol. Paris **152** : 1235-1237.

Grassé, P. P. & others. Traité de Zoologie. Anatomie, systématique biologie. Tome 13. Agnathes et poissons. Paris (Masson et Cie) : pp. 2758 6 pls. 1889 figs.

Gray, J. L. Effects of diet on growth of channel catfish. Trans. Kansas Acad. Sci. **61** : 288-298.

Greenberg, S. S., Kopac, M. J. & Gordon, M. Cytology and cytochemistry of melanoma cells. Ann. N.Y. Acad. Sci. **67** 1956 : 57-121 41 figs.

Greenwood, P. H. (1). The fishes of Uganda. Kampala (The Uganda Society) pp. [ii] + 124 61 figs.

Greenwood, P. H. (2). A new genus and species of cat-fish (Pisces, Clariidae) from the deeper waters of Lake Victoria. Ann. Mag. nat. Hist. (13) **1** : 321-325 1 fig.

Greenwood, P. H. (3). Reproduction in the East African lung-fish *Protopterus aethiopicus* Heckel. Proc. zool. Soc. Lond. **130** : 547-567 1 pl.

Greer, J. K. & Cross, F. B. Fishes of El Dorado City Lake, Butler County, Kansas. Trans. Kansas Acad. Sci. **59** 1956 : 358-363.

Grey, M. (1). Second specimen of the bathypelagic fish *Photostylus pycnoperus*. Copeia **1958** : 56-57.

Grey, M. (2). Descriptions of abyssal benthic fishes from the Gulf of Mexico. Fieldiana Zool. **39** : 149-183.

Griffith, J. The systematic position of *Brouneichthys ornatus* Woodward (Pisces), Actinoptergii). Proc. zool. Soc. Lond. **131** : 157-161 1 pl. figs.

Grobbe, G. & Hahn, G. Morphologie und Histologie der Seitenorgane des augenlosen Höhlenfisches *Anoptichthys jordani* im Vergleich zu anderen Teleosteen. Z. Morph. Ökol. Tiere **47** : 249-266 9 figs.

Grobe, J. *Brochis coeruleus*. Aquar. Terrar. Z. **11** : 225.

Grodzinski, Z. & Pigoń, A. The respiratory rate of sea-trout, *Salmo trutta* L., heart during embryonal development. Bull. Acad. polon. Sci. (2) **4** 7-8 1956 : 283-288.

Groenwald, A. A. & J. A revision of the genera *Barbus* and *Varicorhinus* (Pisces : Cyprinidae) in Transvaal. Ann. Transv. Mus. **23** : 263-330 12 pls. 3 figs.

(Gromov, V. V.). [Influence of industrial discharge on aquatic fauna and fish hauls in mid Kama river.] Ichthyol. Problems **10** : 172-187. [In Russian.]

Grose W. (1). Über die älteste Arthrodiren-Gattung. Notizbl. hess. Landesamt. Bodenforsch. **86** : 7-30 3 pls. figs.

Gross, W. (2). Anaspiden-Schuppen aus dem Ludlow des Ostsegebiets. Paläont. Z. **32** : 24-37 3 pls. figs.

Gross, W. (3). Über den von R. Hoernes 1891 entdeckten Arthrodiren-Rest aus dem Grazer Paläozoikum. Jb. geol. Bundesanst. Wien **101** : 139-146 figs.

Grundfest, H. see Mathewson, R.

Grunewald-Lowenstein, M. Influence of light and darkness on the pineal body in *Astyanax mexicanus* (Filippi). Zoologica N.Y. **41** 1956 : 119-128 2 pls.

Grützner, L. (1). Versuche zur Züchtung des Gewebes von *Macropodus opercularis* (Linné) und *Lebistes reticulatus* (Peters) in vitro. Zbl. Bakt. Orig. **165** 1956 : 8-24 5 pls. 2 figs.

Grützner, L. (2). Überprüfung einiger Anwendungsmöglichkeiten der Gewebe kultur von *Lebistes reticulatus* (Peters) und *Macropodus opercularis* (Linné) in der Virusforschung. Zbl. Bakt. Orig. **165** 1956 : 81-96 5 pl. 2 figs.

Gudjónsson, B. Large salmon in Iceland. *Nátturufraedingurinn* 27 : 194-198 1 fig. [Icelandic with English summary.]

Guérin, S. Contribution à l'étude géologique et paléontologique du Trias supérieur et du Lias inférieur de la région de Saint-Rambert-en-Bugey (Jura méridional). *Sciences de la Terre*, 5 : 13-51 4 pls. figs.

Guerra, M. Monstruosita d'origine traumatica in una trota (*Salmo fario*). *Natura*, Milano 48 1957 : 143 fig.

Guibé, J. & Spillmann, J. Au sujet de quelques types de Cyprinidés (Poissons) de Cuvier et Valenciennes. *Bull. Mus. Hist. nat. Paris* (2) 29 : 462-463.

Gunasekera, C. *see* Lantz, A. W.

Gunning, G. E. & Lewis, W. M. (1). Recent collections of some less common fishes in southern Illinois. *Trans. Ill. Acad. Sci.* 48 1956 : 23-26 1 fig.

Gunning, G. E. & Lewis, W. M. (2). The fish population of Sugar Creek, Illinois. *Trans. Ill. Acad. Sci.* 49 1957 : 21-24.

Gunter, G. (1). A description of a red drum, *Sciaenops ocellata*, without eyes, with a consideration of the implications. *Amer. Nat.* 90 1956 : 267-269.

Gunter, G. (2). Population studies of the shallow water fishes of an outer beach in south Texas. *Publ. Inst. mar. Sci. Univ. Tex.* 5 : 186-193.

Gunter, G. *see* Simpson, D. G.

Gupta, P. D. & Bhowmick, R. M. An interesting case of albinism in *Arius jella* Day from India. *Sci. & Cult.* 24 6 : 283.

Gustafson, K.-J. *see* Fabricius, E.

Guthrie, M. J. & Anderson, J. M. *General Zoology*. New York (John Wiley & Sons), 1957, pp. xv + 708, 1 chart, text illust.

Haeger, J. S. *see* Harrington, R. W.

Hafner, M. *Corydoras schultzei* (Holly), der Goldbindenpanzerwels. *Aquar. Terrar. Z.* 11 : 362-364.

Hagiwara, S. & Saito, N. Mechanism of action potential production in the nerve cell of a puffer. *Proc. Japan Acad.* 33 1957 : 682-685 2 figs.

Hahn, G. *see* Grobbel, G.

Haimovici, S. *see* Necrasov, O.

Halsband, E. Der Einfluss der Stoffwechselintensität auf die Reizempfindlichkeit der Fische gegen elektrischen Strom. *Arch. Fisch. Wiss.* 8 1957 : 140-150 2 figs.

Halstead, B. W. & others. On the morphology of the "hairs" of the rare deep sea fish, *Mirapinna esau*. *Ann. Mag. nat. Hist.* (12) 10 : 767-768.

Halstead, B. W. *see* Kawabata, T.

Halstead, B. W. *see* Ralls, R. J.

Hamada, K. (1). Ecological study of the pond smelt, *Hypomesus olidus*. 4. On the age of the pond smelt ascending in the Ishikari River. *Bull. Fac. Fish. Hokkaido* 7 1956 : 213-218 3 figs.

Hamada, K. (2). Ecological study of *Hypomesus japonicus* 1. Conclusion as to age. *Bull. Fac. Fish. Hokkaido* 7 1956 : 219-224 1 pl.

Hamano, S. Physico-chemical studies on the activation and fertilization of fish eggs. *Mem. Fac. Fish. Hokkaido Univ.* 5 1957 : 91-143 17 figs.

Hamdy, A. R. (1). The development of the spiracular cartilage of *Rhinobatus halavi*. *Proc. Egypt. Acad. Sci.* 11 1956 : 74-78 3 figs.

Hamdy, A. R. (2). The development of the extravisceral cartilages of *Rhinobatus halavi*. *Proc. Egypt. Acad. Sci.* 11 1956 : 79-83 8 figs.

Hamdy, A. R. (3). The development of the hyoid arch in *Rhinobatidae*. *Proc. Egypt. Acad. Sci.* 12 1957 : 58-71 8 figs.

Hamilton, J. A. R. & Andrew, F. J. An investigation of the effect of Baker Dam on downstream-migrant salmon. *Bull. int. Pacif. Salm. Fish. Comm.*, No. 6 1954 : 1-73 28 figs.

Hamilton, J. D. *see* Slack, H. D.

Hancock, C. D. & Sublette, J. E. A survey of the fishes in the Upper Kisatchie drainage of West Central Louisiana. *Proc. La Acad. Sci.* 20 : 38-52.

Haneda, Y. Studies on the luminous organisms found in waters adjacent to the Pacific coasts of Japan. *Rec. oceanogr. Wks. Jap. Spec. no. 1* 1957 : 97-102.

Haneda, Y. & Johnson, F. H. The luciferin-luciferase reaction in a fish, *Parapriacanthus beryciformis*, a newly discovered luminescence. *Proc. nat. Acad. Sci. Wash.* **44** : 127-129 2 figs.

Hantke, R. Ptychodus-Zähne aus dem Seewerkalk von Grabs (Kt. St. Gallen). *Ecl. geol. helv.* **51** : 61-64 1 pl.

Harada, E. *see* Okuno, R.

Harder, W. The intestine as a diagnostic character in identifying certain Clupeoids (Engraulididae, Clupeidae, Dussumieriidae) and as a morphometric character for comparing anchoveta (*Cetengraulis mysticetus*) populations. *Bull. Inter-Amer. Tuna Comm.* **2** : 367-388 6 figs.

Harding, J. P. & Wheeler, A. C. Heavy infestation by the parasitic Copepod *Lernaenicus* of sprats in the river Crouch. *Nature, Lond.* **182** : 542-543 2 figs.

Harrington, R. W. (1). Sexual photoperiodicity of the cyprinid fish, *Notropis bifrenatus* (Cope), in relation to the phases of its annual reproductive cycle. *J. exp. Zool.* **135** 1957 : 529-555 7 figs.

Harrington, R. W. (2). Morphometry and ecology of small tarpon, *Megalops atlantica* Valenciennes from transitional stage through onset of scale formation. *Copeia* **1958** : 1-10 2 pls. 5 figs.

Harrington, R. W., Bidlingmayer, W. L. Effects of dieldrin on fishes and invertebrates of a salt marsh. *J. Wildl. Managt* **22** : 76-82.

Harrington, R. W. & Haeger, J. S. Prolonged natural deferment of hatching in killifish. *Science* **123** : 1511.

Harrington, R. W. & Rivas, L. R. The discovery in Florida of the Cyprinodont fish, *Rivulus marmoratus*, with a redescription and ecological notes. *Copeia* **1958** : 125-130 1 pl. 3 figs.

Hart, J. S. Seasonal changes in CO₂ sensitivity and blood circulation in certain fresh-water fishes. *Canad. J. Zool.* **35** 1957 : 195-200 3 figs.

Härtel, K. (1). Mein Zuchterfolg mit *Ambassis lala*. *Aquar. Terrar. Z.* **11** : 7-8.

Härtel, K. (2). Pflege und Zucht des Blauen Fadenfisches. *Aquar. Terrar. Z.* **11** : 331-332 1 text-fig.

Hartley, W. G. (1). The microscopical study of salmon scales. *J. Quekett micr. Cl.* (4) **5** : 95-98 3 figs.

Hartley, W. G. (2). A projector for the measurement of fish-scales. *J. roy. micr. Soc.* (3) **76** : 162-167 1 pl. 2 figs.

Hartman, G. F. Mouth size and food size in young rainbow trout, *Salmo gairdneri*. *Copeia* **1958** : 233-234.

Hasan, G. Sur l'importance fonctionnelle de quelques particularités morphologiques de la colonne vertébrale des poissons Téléostéens. *An. Sti. Univ. Iasi. N.S.* (2) **3** 1-2 1957 : 105-120 14 figs.

Hasan, G. *see* Necrasov, O.

Hashimoto, Y. *see* Okaichi, T.

Hashmi, T. A. The skeleton of *Rita rita* (Hamilton) (Teleostei, Siluridae). *Biologia, Lahore* **3** 1957 : 73-121 37 figs.

Haskell, D. C. *see* Adelman, W. J.

Hasler, A. D. Perception of pathways by fishes in migration. *Quart. Rev. Biol.* **31** 1956 : 200-209 1 fig.

Hassler, W. W. (1). Age and growth of the sauger, *Stizostedion canadense canadense* (Smith), in Norris Reservoir. *J. Tenn. Acad. Sci.* **32** 1957 : 55-76 5 figs.

Hassler, W. W. (2). The fecundity, sex ratio, and maturity of the Sauger in Norris Reservoir, Tennessee. *J. Tenn. Acad. Sci.* **33** : 32-38 2 figs.

Hastings, C. E. *see* Cross, F. B.

Hatanaka, M. & others (1). Growth and food consumption in young mackerel, *Pneumatophorus japonicus* (Houttuyn). *Tohoku J. agric. Sci.* **7** 1957 : 351-368 6 figs.

Hatanaka, M., & others (2). Experimental studies on the feeding habits of amber-fish, *Seriola quinqueradiata* T. et S. *Bull. jap. Soc. sci. Fish.* **24** : 251-255. [Japanese with English summary.]

Hatanaka, M. *see* Takahashi, M.

Hattori, S., Watanabe, T. & Okutani, T. Fish larvae and eggs in the "Kuroshio" area, South of Honshu, May 1955. *Rec. oceanogr. Wks. Jap. Spec. no. 1* 1957 : 143-158 14 figs.

Hayashi, S. A note on scales of the pink salmon. Bull. Tokai Fish. Res. Lab., No. 16 1957 : 7-14 1 pl. 3 figs.

Hayashi, S. & Kondo, K. Growth of the Japanese anchovy—IV. Age determination with the use of scales. Bull. Tokai Fish. Res. Lab. No. 17 1957 : 31-64 4 pls. 24 figs.

Hayasi, T. *see* Kobayasi, H.

Healy, A. & Kennedy, M. Trout in Lough Gloire, Co. Westmeath, Ireland. Salm. Trout Mag. No. 153 : 102-114.

Hegemann, M. Beiträge zur Biologie des Hechtes im Brackwassergebiet des Greifswalder Boddens. Z. Fisch. 7 : 459-476 11 figs.

Heintz, A. (1). The dorsal shield of *Psammodiplosis paradoxa* Ag. J. Palaeont. Soc. India 2 1957 : 152-162 3 text-figs. pls. xvii-xix.

Heintz, A. (2). The head of the Anaspid *Birkenia elegans*, Traq. In "Studies on Fossil Vertebrates" London : 71-85 4 text-figs.

Heldt, H. (1). Rapport sur la sardine "*Clupea pilchardus*" (Walbaum). Rapp. Comm. int. Mer Médit. 13 1956 : 115-144.

Heldt, H. (2). Sur la présence de la lamproie (*Petromyzon marinus* L.) dans les eaux tunisiennes. Rapp. Comm. int. Mer Médit. 14 : 369-370.

Hellier, T. R. The drop-net quadrat, a new population sampling device. Publ. Inst. mar. sci. Univ. Tex. 5 : 165-168 1 fig.

Hemphill, D. V. & Follett, W. I. First record of the agonid fish *Pallasina barbata* aix Starks, from California. Calif. Fish Game 44 : 281-283.

Herbert, D. W. M. *see* Allan, J. R. H.

Herbert, E. C. *see* May, M. M.

Heuschmann, O. (1). Die Hechtartigen. Ordnung Haploimi (Esociformes) in Demoll & Maier, Handb. Binnenfischerei Mitteleuropas, Stuttgart Band III Lfg. 8 1957 : 1-22 10 figs.

Heuschmann, O. (2). Die Weissfische (Cyprinidae) in Demoll & Maier, Handb. Binnenfischerei Mitteleuropas, Stuttgart Bd. III. Lfg. 8 1957 : 23-199 112 figs.

Heuts, M. J. & Leleup, N. La géographie et l'écologie des grottes du Bas-Congo. Les habitats de *Caecobarbus geertsii* Blgr. Ann. Mus. Congo belg. Zool. Ser. 8vo. 35 1954 : 1-71 frontis. 12 pls. 29 text-figs.

Heuts, M. J. *see* Spaas, J. T.

Heyler, D. Remarques sur la caudale d'Acanthodes. C.R. Acad. Sci. Paris 247 : 1636-1639 1 fig.

Hiatt, R. W. *see* Burroughs, H.

Hiatt, R. W. *see* Strasburg, D. W.

Hickling, C. F. Fisheries development in the Colonial territories. Adv. Sci. 14 : 317-322.

Hikita, T. (1). A preliminary list of fishes from the Northern Pacific Ocean. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 46-48 1 fig.

Hikita, T. (2). Occurrence of the mottled dog-salmon, *Oncorhynchus keta* (Walbaum). Sci. Rep. Hokkaido Salmon Hatchery No. 12 : 45-49 1 text-fig. 1 pl. [Japanese with English summary.]

Hikita, T. (3). On the hermaphroditic gonads of the blueback salmon (*O. nerka*) and the chum salmon (*O. keta*). Sci. Rep. Hokkaido Salmon Hatchery No. 12 : 111-114 text-figs. 1 and 2.

Hildemann, W. H. Scale homotransplantation in goldfish (*Carassius auratus*). Ann. N.Y. Acad. Sci. 64 1957 : 775-791 9 figs.

Hill, H. W. & Lee, A. J. The effect of wind on water transport in the region of the Bear Island fishes. Proc. roy. Soc. 148B : 104-116 6 figs.

Hillmer, H. Zucht von *Hemigrammus erythrozonus* Durbin im Torfbecken. Aquar. Terrar. Z. 10 1957 : 286-287 fig.

Hills, E. S. A brief review of Australian fossil vertebrates. In "Studies on Fossil Vertebrates" London : 86-107.

Hilton, W. A. The brain chorioid plexuses of ganoids and teleosts. Bull. S. Calif. Acad. Sci. 57 : 1-4 2 pls.

Hirano, T. *see* Kikuchi, T.

Hirao, S. & others. Carotenoids in fish, the distribution of xanthophylls in various fishes. Bull. Tokai Fish. Res. Lab., No. 16 1957 : 53-58 4 figs.

Hirata, H. Diurnal rhythm of the feeding activity of goldfish in winter and early spring. *Bull. Fac. Fish. Hokkaido* **8** 1957: 96-107 5 figs.

Hirata, H. & Kobayashi, S. Diurnal rhythm of the feeding activity of goldfish in autumn and early winter. *Bull. Fac. Fish. Hokkaido Univ.* **7** No. 2 1956: 72-84.

Hirosaki, Y. Observations on ecdysis in Japanese fishes (Preliminary Report). *J. Fac. Sci. Hokkaido Univ. (Zool.)* **13** 1957: 178-199.

Hirosaki, Y. & others. On the growth of some marine fishes in the aquarium. *Misc. Rep. Res. Inst. nat. Resour. Tokyo* No. 41-42 1956: 100-108. [English summary.]

Hisaoka, K. K. & Battle, H. I. The normal developmental stages of the zebrafish, *Brachydanio rerio* (Hamilton-Buchanan). *J. Morph.* **102**: 311-327 32 figs.

Hiyama, Y. & Ichikawa, R. Uptake of strontium by marine fish from the environment. *Rec. oceanogr. Wks. Japan N.S.* **3** 1957: 78-84.

Hiyama, Y. & Yasuda, F. The methods of utilization of plankton by fishes. *Rec. oceanogr. Wks. Jap. Spec. no. 1* 1957: 67-76 1 fig.

Hiyama, Y. *see* Ichikawa, R.

Hiyama, Y. *see* Kurogane, K.

Hiyama, Y. *see* Yasuda, F.

Hoar, W. S. (1). Effects of synthetic thyroxine and gonadal steroids on the metabolism of goldfish. *Canad. J. Zool.* **36**: 113-121 1 fig.

Hoar, W. S. (2). Rapid learning of a constant course by travelling schools of juvenile Pacific salmon. *J. Fish. Res. Bd. Can.* **15**: 251-274.

Hoar, W. S. (3). The evolution of migratory behaviour among juvenile salmon of the genus *Oncorhynchus*. *J. Fish. Res. Bd. Can.* **15**: 391-428 12 figs.

Hoar, W. S. & others. Reactions of juvenile Pacific salmon to light. *J. Fish. Res. Bd. Can.*, **14** 1957: 815-830 4 figs.

Hoar, W. S. *see* Irvine, D. G.

Hochman, L. Ichthyologische Untersuchungen des Flusses Moravice. *Acta Univ. Agric. Silv. Brunn* **1957A** **1** 1957: 83-117 4 pls. [German summary.]

Hodder, V. M. *see* Templeman, W.

Hodgson, W. C. On the interpretation of the East Anglian herring data 1923-1955. *J. Cons. int. Explor. Mer* **23**: 381-389 4 figs.

Hoedeman, J. J. (1). Le statut du genre *Barbus* Cuvier & Cloquet, 1816. *Barbus kahajani* proposé comme nom de substitution pour *Barbus tetrazona* Bleeker, 1857, un homonyme secondaire de *Barbus tetrazona* Bleeker, 1855. *Beaufortia* **6**: 199-201.

Hoedeman, J. J. (2). The frontal scalation pattern in some groups of toothcarps (Pisces-Cyprinodontiformes). *Bull. aquat. Biol.* **1** **3**: 23-28 7 figs.

Hoedeman, J. J. (3). Rivulid fishes of the Antilles. *Natuurwet. Stud. Suriname* No. 17: 112-126 1 pl. 9 figs.

Hoese, H. D. A partially annotated checklist of the marine fishes of Texas. *Publ. Inst. mar. Sci. Univ. Tex.* **5**: 312-352 1 fig.

Hoese, H. D. & Berglund, C. O. Coloration in Texas hogchokers, *Trinectes maculatus fasciatus*. *Copeia* **1958**: 55-56.

Hoese, H. D. & Moore R. B. Notes on the life history of the bonnetnose shark, *Sphyrna tiburo*. *Texas J. Sci.* **10**: 69-72.

Hoese, H. D. *see* Reid, G. K.

Hoese, H. D. *see* Springer, V. G.

Hoestlandt, H. Reproduction de l'Alose Atlantique (*Alosa alosa* Linné) et transfert au Bassin Méditerranéen. *Verh. int. Ver. Limnol.* **13**: 736-742 2 pls. 1 fig.

Hofstede, A. E. Conservation and development of inland fisheries. *Sudan Notes* **37** 1956: 113-119.

Hofstetter, A. M. & others (1). The auditory organ and its relation to the skull bones of a freshwater teleost. *Anat. Rec.* **129** 1957: 79-82 1 pl.

Hofstetter, A. M. & others (2). Skeletal differences between the black and white crappies. *Trans. Amer. micr. soc.* **77**: 19-21.

Hogben, C. A. M. The teleostean swim-bladder. *Nature, Lond.* **182**: 1622.

Hollands, M. *see* Brett, J. R.

Holliday, F. G. T. *see* Blaxter, J. H. S.

Holliday, F. G. T. *see* Parrish, B. B.

Holmberg, E. K. *see* Phillips, J. B.

Holmgren, U. On the pineal organ of the tuna, *Thunnus thynnus* L. *Breviora* No. 100 : 1-5 2 pls.

Holmquist, C. An observation on young specimens of *Ammodytes dubius*. *Medd. Grønland* 159 : 10-14 map.

Homei, V. *Hucho hucho* L. dans les eaux de la Republique Populaire Roumaine. *Ocotirea Nat.*, București 2 1956 : 101-109 5 figs.

Honna, Y. (1). Further additions to "A list of the fishes collected in the Province of Echigo, including Sado Island" (V.). *Jap. J. Ichth.* 6 1957 : 109-112.

Honma, Y. (2). On the thyroid gland of some Japanese teleosts. *Jap. J. Ichth.* 6 1957 : 113-120 7 figs. [English summary.]

Honma, Y. (3). On two new specimens of the catadromous eels from the Sea of Japan. *Bull. Jap. Soc. sci. Fish.* 24 : 87-92.

Honma, Y. (4). On the aberrant body color found in synophthalmic chum salmon parr *Oncorhynchus keta* (Walbaum). *Bull. Jap. Soc. sci. Fish.* 24 : 93-99 13 figs. [Japanese with English summary.]

Honma, Y. & Murakawa, S. Effect of thiourea on the development of goldfish larvae (*Carassius auratus* Linné juv). *Jap. J. Ichth.* 6 1957 : 121-127.

Hoogland, R. & others. The spines of sticklebacks (*Gasterosteus* and *Pygosteus*) as means of defence against predators (*Perca* and *Esox*). *Behaviour* 10 1957 : 205-236 15 figs.

Hooijer, D. A. The Pleistocene Vertebrate fauna of Celebes. *Arch. Néerland. Zool.* 13 1 Suppl. : 89-96.

Hooper, F. F. *see* Fukano, K. G.

Hoppe, W. *Nothobranchius guentheri* (Pfeffer). *Aquar. Terrar. Z.* 11 : 1-2 (photos.).

Hora, S. L. (1). Symposium on Hilsa and its fisheries—a review. *J. Asiat. Soc. (Sci.)* 20 1954 : 1-5.

Hora, S. L. (2). Fish in the Játaka sculptures. *J. Asiat. Soc. (Letrs.)* 21 1 1955 : 1-13 5 pls. 5 figs.

Hora, S. L. (3). Fish paintings of the third millennium B.C. from Nal (Baluchistan) and their zoogeographical significance. *Mem. Indian Mus.* 14 1956 : 73-86 10 fig. 3 pl.

Hora, S. L. & Saraswati, S. K. Fish in the Játaka tales. *J. Asiat. Soc. (Letrs.)* 21 1 1955 : 15-30.

Hoshina, T. (1). An epidemic disease affecting rainbow-trout in Japan. *J. Tokyo Univ. Fish.* 42 1956 : 15-16 1 pl.

Hoshina, T. (2). Further observations on the causative bacteria of the epidemic diseases like furunculosis of rainbow-trout. *J. Tokyo Univ. Fish.* 43 1957 : 59-66.

Hoshina, T. (3). Über die elektron-mikroskopischen Beobachtungen des Erregers der Vibrionen-Seuche der Regenbogenforeller. *J. Tokyo Univ. Fish.* 44 : 73-74.

Hoshina, T. & Ookubo, M. On a fungi-disease of eel. *J. Tokyo Univ. Fish.* 42 1956 : 1-13 1 pl. 3 text-f.

Hoshina, T. & others. Preliminary studies on control of the vibrio disease of rainbow-trout. *Bull. Jap. Soc. Sci. Fish.* 23 1957 : 241-244 1 fig. [Japanese with English summary.]

Hoshina, T. & others. A streptococcus pathogenic to fish. *J. Tokyo Univ. Fish.* 44 : 57-68.

Hotta, H. & Tamura, T. On the fishing condition and size of horse mackerel, *Trachurus japonicus*, taken in the Pacific coast of Tokushima Prefecture. *Jap. J. Ichth.* 6 1957 : 65-70 3 figs.

Houck, W. J. Another record of the Agonid *Bothragonus swani* from California. *Copeia* 1958 : 57.

Houdemer, F. E. Ichthyologie et philatélie. *Cahiers des Nat. N.S.* 14 : 29-32.

Houot, G. S. Four years of diving to the bottom of the sea. *Nat. geogr. Mag.* 113 : 715-731 figs.

Hourston, A. S. Population studies on juvenile herring in Barkley Sound, British Columbia. *J. Fish. Res. Bd. Canada* 15 : 909-960 16 figs.

Hourston, A. S. *see* Taylor, F. H. C.

Houston, A. H. Responses of juvenile chum, pink and coho salmon to sharp sea-water gradients. *Canad. J. Zool.* **35** 1957 : 371-383 9 figs.

Howard, G. V. & Landa, A. A study of the age, growth, sexual maturity, and spawning of the anchoveta (*Cetengrulis mysticetus*) in the Gulf of Panama. *Bull. Inter Amer. Tuna Comm.* **2** : 391-437.

Howell, J. H. *see* Applegate, V. C.

Hruška, V. Contribution to feeding habits of the roach in the pool Poltruba. *Univ. Carol. Prag. 2 Biol.* 1956 : 161-207. [English summary.]

Hsu, M. K. & Jen, Y. F. A preliminary determination of cholesterol in the brains of *Ophiocephalus argus*. *Acta zool. Sinica* **7** 1955 : 31-36. [English summary.]

Hubbs, Clark (1). Fertility of F_1 hybrids between the percoid fishes. *Etheostoma spectabile* and *E. lepidum*. *Copeia* 1958 : 57-59.

Hubbs, Clark (2). Geographic variations in egg complement of *Percina caprodes* and *Etheostoma spectabile*. *Copeia* 1958 : 102-105 2 figs.

Hubbs, Clark (3). *Gambusia senilis* from the Devil's River, Texas, an addition to the fish fauna of the United States. *Copeia* 1958 : 239.

Hubbs, Clark (4). A checklist of Texas fresh-water fishes. *Texas Game Fish Comm. Ser. 1F. No. 3* : 1-14.

Hubbs, Clark & Drewry, G. E. Long duration of sperm function in two euryhaline fishes and its lack of significance in hybridization. *Amer. Nat.* **92** : 378-380.

Hubbs, Clark & Stavenhagen, L. Effects of maternal carotenoid deficiency on the viability of darter (*Osteichthyes*) offspring. *Physiol. Zool.* **31** : 280-283.

Hubbs, Clark & Strawn, K. Survival of F_1 hybrids between fishes of the subfamily Etheostominae. *J. exp. Zool.* **134** 1957 : 33-62.

Hubbs, C. L. (1). Position of anal fin and length of body cavity in Catostomid and Cyprinid fishes. *Copeia* 1958 : 56.

Hubbs, C. L. (2). *Ogcocephalus darwini*, a new batfish endemic at the Galapagos Islands. *Copeia* 1958 : 161-170 5 pls.

Hubbs, C. L. (3). *Dikellorhynchus* and *Kanazawaichthys*. Nominal fish genera interpreted as based on prejuveniles of *Malacanthus* and *Antennarius* respectively. *Copeia* 1958 : 282-285.

Hubbs, C. L. & Hubbs, C. *Notropis saladonis*, a new cyprinid fish endemic in the Rio Salado of north-eastern México. *Copeia* 1958 : 297-307 3 figs.

Hubbs, C. L. & Rechnitzer, A. B. A new fish, *Chaetodon falcifer*, from Guadalupe Island, Baja California, with notes on related species. *Proc. Calif. Acad. Sci.* (4) **29** : 273-313 3 pls. map.

Huculak, F. Über Kiemenfäule der kleinen Maräne (*Coregonus albula*) in der Versuchsteichwirtschaft Laudek der Anstalt für Teichbiologie der polnischen Akademie der Wissenschaften. *Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 6* : 3-22 14 figs. [Polish with German summary.]

Huffman, M. N. *see* Jones, R. W.

Hughes, G. M. & Shelton, G. Pressure changes during the respiratory movements of teleostean fishes. *Nature, Lond.* **179** 1957 : 255 1 fig.

Hulot, A. L. *see* Wilhelm, O. E.

Hulse, D. C. & Miller, L. F. Harvesting of largemouth bass on Wheeler Reservoir, Alabama, 1952-1956. *J. Tenn. Acad. Sci.* **33** : 78-83.

Hunstman, A. G. Shubenacadie salmon. *J. Fish. Res. Bd. Can.* **15** : 1213-1218 1 fig.

Husain, A. Possibility of cross-fertilisation in certain genera and species of carp. *Pakistan J. Sci.* **3** 1954 : 110-112 4 figs.

Hussein, K. Z. Morphology of the tail fin in Ophicephalidae. *Biologia, Lahore* **2** 1956 : 21-25 3 figs.

Ibrahim, K. H. Bionomics of forage fishes: Observations on the fecundity of three common species of minor barbels. *J. Bombay nat. Hist. Soc.* **54** 1957 : 826-834.

Ichikawa, R. & Hiyaama, Y. The amount of up-take of strontium by marine fish from the environment of various concentration of calcium and strontium. Rec. oceanogr. Wks. Japan N.S. 4 1957 : 55-66 6 figs.

Ichikawa, R. *see* Hiyaama, Y.

Ichimura, T. *see* Hatanaka, M.

Idler, D. R. & others. Biochemical studies on sockeye salmon during spawning migration. I-IV. Canad. J. Biochem. & Phys. 36 : 783-803 [*see also* Stud. Fish. Res. Bd. Can. Nos. 520, 536, 537, 539.]

Idyll, C. P. A shocking way to fish. Sea Frontiers 4 : 89-100.

Igarashi, H. *see* Zama, K.

Igarasi, K. On the three spined stickleback *Pungitius sinensis* found in Fukui Prefecture. Zool. Mag. Tokyo 67 : 173-175 2 figs. [Japanese with English summary.]

Ilii, S. *see* Feider, Z.

Imai, K. *see* Enami, M.

Imamura, S. *see* Phillips, J. B.

Imamura, Y. Study on the disposition of fish towards the light. 2. The strength of illumination preferred by fish. J. Tokyo Univ. Fish. 44 : 75-89 1 fig.

Inaba, D. & Nomura, M. On the digestive system and feeding habits of young Chinese carps collected in the river Tone. J. Tokyo Univ. Fish. 42 1956 : 17-24 1 pl. 6 figs.

Inaba, D. & others (1). Preliminary report on the spawning of grass-carp and silver-carp in the Tone River, Japan and the development of their eggs. J. Tokyo Univ. Fish. 43 1957 : 81-96.

Inaba, D. & others (2). Studies on the improvement of artificial propagation in trout culture. Bull. jap. Soc. sci. Fish. 23 : 758-764. [Japanese with English summary.]

Inger, R. F. Notes on fishes of the genus *Brachygobius*. Fieldiana, Zool., 39 : 107-117 20 figs.

Inger, R. F. *see* Woods, L. P.

Innes, W. T. Exotic aquarium fishes; a work of general reference. 19th ed. Edited by G. S. Myers. Inners Publishing Co. Philad. 1957 : 1-541 figs.

Inoue, M. Studies on movements of Albacore fishing grounds in the Northwest Pacific Ocean. Bull. jap. Soc. sci. Fish., 23 : 673-679 6 figs.

Inoue, M. & Ogura, M. (1). The swimming-water-depth for anchovy shoals in Tokyo Bay. Bull. jap. Soc. sci. Fish. 24 : 311-316 6 figs.

Inoue, M. & Ogura, M. (2). The characteristic behaviours of anchovy shoals called "rippling" and "jumping" in Tokyo Bay. Bull. jap. Soc. sci. Fish. 24 : 317-321.

(Ioff, N. A.). [The influence of temperature upon the sexual cycle in *Phoxinus phoxinus* L.]. C.R. Acad. URSS 118 : 621-624 4 figs. [In Russian.]

Ionescu, N. & Serpoianu, Gh. Observatii asupra hranei rechinului (*Squalus acanthias* L.) din Marea Neagra. Bul. Inst. Cercet. Pisc. Roman. 17 (1) : 57-64.

Ionescu, N. & others. Contribution à la connaissance de la biologie de la pélamide (*Sarda sarda* Bloch) et de sa pêche dans les eaux roumaines de la mer Noire entre 1954 et 1956. Hidrobiol., București 1 : 165-186 1 fig.

Irie, T. (1). The crystal texture of the otolith of a marine teleost, *Pseudosciaena*. J. Fac. Fish. Hiroshima Univ. 1 1955 : 1-8 3 pls.

Irie, T. (2). On the forming season of annual rings (opaque & translucent) in the otoliths of several marine teleosts. J. Fac. Fish. Hiroshima Univ. 1 1957 : 311-317 2 figs. 1 pl.

Irvine, D. G. & others. Effects of dietary phospholipid and cholesterol on the temperature resistance of goldfish. Canad. J. Zool. 35 1957 : 691-709 13 figs.

Ishibashi, T. Effect of the intracellular injection of inorganic salts on fish scale melanophore. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 449-454 2 figs.

Ishihara, K. Effect of 2, 4-Dinitrophenol and sodium azide on the ammonia production in the embryos of *Oryzias latipes*. J. Fac. Sci. Tokyo Univ. (Zool.) 7 1956 : 525-533.

Ishii, S. Effects of estradiol benzoate on induction of gonopodial-like structure by testosterone in females of the guppy, *Lebistes reticulatus*. J. Fac. Sci. Tokyo Univ. (Zool.) 8 1957: 149-161 19 figs.

Ishii, S. see Egami, N.

Ishiwata, N. see Kubo, I.

Ishiyama, R. (1). Observations on the egg-capsules of skates of the family Rajidae, found in Japan and its adjacent waters. Bull. Mus. comp. Zool. Harvard 118: 1-24 10 figs.

Ishiyama, R. (2). Studies on the rajid fishes (Rajidae) found in the waters around Japan. J. Shimonoseki Coll. Fish. 7: 193-394 3 pls. 86 figs.

Ishiyama, R. & Okada, K. Post-larval form of the skipjack (*Katsuwonus pelamis*) from the Phoenix Islands. J. Shimonoseki Coll. Fish. 7 1957: 141-146 1 fig.

Islam, A. see Bhatti, H. K.

Ito, K. Ecological studies of *Hypomesus japonicus* (Brevoort). I & II. Sci. Rep. Hokkaido Fish Hatch. No. 12 1957: 79-87 8 figs. [Jap. with English summary.]

Ito, S. Studies on the effect of hydrogen ion concentrations; ovarian and other organic fluids upon the activation of eggs of a fresh water fish, *Plecoglossus altivelis*. Kumamoto J. Sci. (2B) 2 1956: 230-238 2 pls.

Ito, T. see Nakamura, K.

(Ivanov, K. P.). [Vertebrates deprived of erythrocytes and hemoglobin.] Priroda 5: 97-98. [In Russian.]

Ivanov, M. F. The development of the gelatinous membrane of the egg-cells in some fishes. Vestn. Leningr. Univ. No. 21: 57-62 6 figs.

Ivasik, V. M. Influenta pestilior salbatici asupra raspindirii bolilor parazitare in gospodariile de eleste. Bul. Inst. Cercet. Pisc. Roman. 16 (3) 1957: 69-70.

Iversen, E. S. & Yoshida, H. O. Notes on the biology of the Wahoo in the Line Islands. Pacif. Sci. 11 1957: 370-379 7 figs.

Iwai, T. (1). The sequence of yolk absorption in the embryo of the deep-sea luminous shark, *Etmopterus lucifer* Jordan et Snyder. Bull. Jap. Soc. Sci. Fish. 23 1957: 295-301 2 figs.

Iwai, T. (2). A study of the luminous organ of the apogonid fish *Siphamia versicolor* (Smith and Radcliffe). J. Wash. Acad. Sci. 48: 267-268 2 figs.

Iwai, T. (3). Gill structures of the deep-sea stomiatoid fish, *Cyclothone microdon* (Günther). Sci. Rep. Yokosuka City Mus. No. 3: 1-4 3 figs.

Iwai, T. & Asano, H. On the luminous cardinal fish, *Apogon ellioti* Day. Sci. Rep. Yokosuka City Mus. No. 3: 5-13 4 figs.

Iwai, T. see Matsubara, K.

Iyigüngör, D. Methods and gear at present in use for tuna fishing in Turkey. Proc. Fish. Counc. Mediterr. F.A.O. 4 1957: 251-255.

Jackson, P. A. Movement of salmon on the River Erne. Nature, Lond. 182: 543.

Jackson, P. B. N. A lungfish (*Protopterus*) from the Middle Zambezi. Nature, Lond. 182: 123-124 1 fig.

Jaffee, O. C. Some morphological aspects of the resorption of carbohydrates in the renal tubules of the goldfish (*Carassius auratus*). Anat. Rec. 132: 153-159 9 figs.

Janec-Susłowska, W. Osteologia szezupaka. Warszawa (Panstw. Wydawnictwo Nauk.) 1957: pp. 99 22 pls. 4 figs.

Jang, C-y. [Studies on the skeleton of *Muraenesox cinereus* (Forskäl)]. Acta zool. Sinica 9 1957: 110-119 16 figs. [English summary.]

Jao, C. C. see Wu, H. W.

Jara, Z. (1) On the morphology and function of the so-called palatal organ in the carp (*Cyprinus carpio* L.). Przegl. zool. 1 1957: 176-178 2 figs. [In Polish, English summary.]

Jara, Z. (2). The blood coagulation system in carp. Zool. polon. 8 1957 (1958): 113-129 1 fig.

Jarvi, T. H. Über eingeführte Maränenbestände in einigen Kleingewässern der Gegend von Rovaniemi in Nordfinland. Acta zool. fenn. 89 1955: 1-74 7 pls.

Jarvik, E. Crossopterygierna och de första fyrfota djuren. Svensk Faun. Revy 17 (3) 1955: 80-96 7 figs.

Jen, Y. F. see Hsu, M. K.

Jenkinson, D. W. see Foscett, D. R.

Jensen, A. J. C. *see* Bückmann, A.

Jensen, K. W. Determination of age and growth of *Tilapia nilotica* L., *T. galilaea* Art., *T. zillii* Gerv. and *Lates niloticus* C. et V. by means of their scales. K. norske vidensk. Selsk. Forh. **30** : 150-157 8 figs.

Jerzmańska, A. (1). *Scorpaena ensiger* (Jordan & Gilbert) z miocenu Pińczowa. Acta palaeont. polon. **3** : 151-159 1 pl. figs. [Polish with English and Russian summary.]

Jerzmańska, A. (2). Stan badań nad rybami trzeciorzędowymi w Polsce [Status of research on Tertiary fishes in Poland.] Kwartalnik Geol. **2** : 177-186. [English summary p. 185.]

Jhingran, V. G. Observations on the seaward migration of *Mugil cephalus* Linnaeus from the Chilka Lake for breeding. Curr. Sci. **27** : 181-182.

Jhingran, V. G. *see* Motwani, M. P.

Jitariu, P. & others. Etude physiologique du mode d'existence et du comportement de la truite de Bistrita et de Lacul Roșu. L'importance de l'hydrogène sulfuré pour la vie de la truite. An. Sti. Univ. Iasi. N.S. (2) **3** 1-2 1957 : 18-32.

Job, S. V. (1). The oxygen consumption of *Salvelinus fontinalis*. Univ. Toronto biol. Ser. No. 61 1955 : 1-39 13 figs.

Job, S. V. (2). The routine-active oxygen consumption of the milk fish. Proc. Indian Acad. Sci. **45B** 1957 : 302-313 4 figs.

John, K. R. Comparative rates of survival of normal and deformed Chub, *Gila atraria* Girard, in Two Ocean lake, Teton County, Wyoming. Proc. Pa Acad. Sci. **31** 1957 : 77-82 3 figs.

Johnels, A. G. (1). The mode of terrestrial locomotion in *Clarias*. Oikos **8** 1957 : 122-129 3 figs.

Johnels, A. G. (2). On the cardiac plexus of the vagus intestinalis nerves in *Myxine*. Acta zool., Stockh. **38** 1957 : 283-288 2 figs.

Johnels, A. G. (3). On the dorsal ganglion cells of the spinal cord in lampreys. Acta zool. Stockh. **39** : 201-216 9 figs.

Johnels, A. G. & Ostlund, E. Anatomical and physiological studies on the enteron of *Lampetra fluviatilis* (L.). Acta Zool., Stockh. **39** : 9-12 1 fig.

Johnels, A. G. *see* Augustinsson K.-B.

Johnels, A. G. *see* Fänge, R.

Johnson, D. S. A survey of Malayan freshwater life. Malayan Nature J. **12** 1957 : 57-65 figs. 1-6.

Johnson, F. H. *see* Haneda, Y.

Johnson, P. C. *see* Andrew, F. J.

Johnson, W. C. *see* Pintler, H. E.

Jones, F. R. H. Movements of herring shoals in relation to tidal current. J. Cons. int. Explor. Mer **22** 1957 : 322-328 4 figs.

Jones, F. R. H. & Pearce, G. Acoustic reflexion experiments with perch (*Perca fluviatilis* Linn.) to determine the proportion of the echo returned by the swimbladder. J. exp. Biol. **35** : 437-450 4 figs.

Jones, J. D. Observations on fish poisoning in Mauritius. Proc. Soc. Arts Sci. Mauritius **1** 1956 : 367-385.

Jones, R. E. E. *see* MacLeod, A.

Jones, R. W. & Huffman, M. N. Fish embryos as bio-assay material in testing chemicals for effects on cell division. Trans. Amer. micr. Soc. **76** 1957 : 177-183 7 figs.

Jones, S. Authorship of names of Indian fishes proposed in "Histoire Naturelle des Poissons" by Cuvier and Valenciennes and recorded by Day. J. zool. Soc. India **9** 1957 : 121-129.

Jones, W. G. *see* Phillips, J. B.

Jonet, S. La faune ichthyologique de Homoraciú, district de Prahova. Contributions à l'étude des Schistes dyliques oligocènes de Roumanie. Lisbon 112 pp. 9 pls. 26 text-figs.

Jonsson, J. On the connection between the Icelandic and East Greenlandic stocks of cod. Aegir **51** No. 2 : 1-6. [English summary.]

Jopson, H. G. M. A concentration of the ratfish, *Hydrolagus colliciei* at Cape Arago, Oregon. Copeia **1958** : 232.

Jubb, R. A. (1). Eels in Southern Africa. Nature, Lond. **180** 1957 : 47-48.

Jubb, R. A. (2). A preliminary report on the collections of freshwater fishes made by the Bernard Carp Expeditions to the Caprivi Strip, 1949, the lower Sabi River, 1950, and the Barotseland, 1952. *Occ. Pap. nat. Mus. S. Rhod.* **3** : 177-189 1 fig.

Jubb, R. A. (3). The distribution of freshwater fishes: A note on some Zambesi River species. *S. Afr. J. Sci.* **54** : 218.

Judefind, T. F. *see* Kawabata, T.

Jullien, A. & Ripplinger, J. Physiologie du coeur des poissons et de son innervation extrinsèque. *Ann. Sci. Univ. Besançon (2) Zool. et Phys. No.* **9** 1957 : 35-92 21 figs.

Jullien, A. & others. Effets de l'Histamine et des Antihistaminiques de synthèse sur le comportement des Cephalopodes et de quelques Poissons marins. *Ann. Sci. Univ. Besançon (2) Zool. et Phys. No.* **6** 1957 : 185-193.

June, F. C. Variation in meristic characters of young Atlantic menhaden, *Brevoortia tyrannus*. *Rapp. Cons. Explor. Mer* **143** (2) : 26-35 2 figs.

Kadam, K. M. The development of the chondrocranium in the sea horse, *Hippocampus (Lophobranchii)*. *J. Linn. Soc. Lond. (Zool.)* **43** : 557-573 1 pl. 10 figs.

Kafuku, T. Speciation in Cyprinid fishes on the basis of intestinal differentiation, with some references to that among Catostomids. *Bull. Freshw. Fish. Res. Lab. Tokyo* **8** (1) : 45-78 8 pls. 20 figs.

Kai, H. *see* Okaichi, T.

Kai, T. & Eguchi, H. Studies on the fish culture food. I-II. *Sci. Rep. Hokkaido Fish. Hatch. No.* **12** 1957 : 89-100 8 figs. [Japanese.]

Kai, T. *see* Eguchi, H.

Kaj, J. (1). Contribution to the biology and geographical distribution of *Pelecus cultratus* L. in the drainage basin of the Baltic. *Badania fizjogr. Polsk. Zuchod.* **4** : 213-218. [English summary.]

Kaj, J. (2). Spawning of fish in the lower stretch of the Welna River. *Polsk. Arch. Hydrobiol.* **4** (17) : 183-192 1 fig. [English summary.]

Kalawar, A. G. & Kelkar, C. N. Fishes of Kolhapur. *J. Bombay nat. Hist. Soc.* **53** 1956 : 669-679 3 figs.

Kalk, M. Ecological studies on the shore of Moçambique. I. The fauna of intertidal rocks at Inhaca Island, Delagoa Bay. *Ann. Natal Mus.* **14** : 189-242 2 pls. 8 figs.

Kalleberg, H. Observations in a stream tank of territoriality and competition in juvenile salmon and trout. (*Salmo salar* L. and *S. trutta* L.). *Rep. Inst. Freshw. Res. Drottningh.* **39** : 55-98 14 figs.

Kallman, K. D. & Gordon, M. (1). Transplantation of fin in Xiphophorin fishes. *Ann. N.Y. Acad. Sci.* **71** 1957 : 305-318 4 figs.

Kallman, K. D. & Gordon, M. (2). Genetics of fin transplantation in xiphophorin fishes. *Ann. N.Y. Acad. Sci.* **73** : 599-610 4 figs.

Kamohara, T. (1). Some little known fishes from Kôchi Prefecture (Prov. Tosa), Japan, including one new species of the family Peristediidae. *Jap. J. Ichth.* **6** 1957 : 75-81 1 fig.

Kamohara, T. (2). A catalogue of fishes of Kôchi Prefecture (Province Tosa), Japan. *Rep. Usa Mar. biol. Sta.* **5** No. 1 : 1-76.

Kamohara, T. (3). A review of the labrid fishes found in the waters of Kôchi Prefecture, Japan. *Rep. Usa Mar. biol. Sta.* **5** No. 2 : 1-20 8 pls.

Kamohara, T. (4). The fishes of Urado Bay, Kôchi Prefecture. *Res. Rep. Kôchi Univ.* **7** No. 13 : 1-11. [In Japanese.]

Kamrin, R. P. & Singer, M. The influence of the nerve on regeneration and maintenance of the barbel of the catfish, *Ameiurus nebulosus*. *J. Morph.* **96** 1955 : 173-187 9 figs.

Kanazawa, R. H. (1). A new species of catfish, family Loricariidae, from Ecuador. *Copeia* **1958** : 327-328 1 fig.

Kanazawa, R. H. (2). A revision of the eels of the genus *Conger* with descriptions of four new species. *Proc. U.S. Nat. Mus.* **108** : 219-267 4 pls. 7 figs.

Kanda, K. Vertical distribution of bottom fish. I, II, III. *Bull. Jap. Soc. Sci. Fish.* **24** : 13-15 & 103-120.

Kändler, R. & Pirwitz, W. Über die Fruchtbarkeit der Plattfische im Nordsee-Ostsee-Raum. Kieler Meeresforsch. **13** (1) 1957 : 11-34 11 pls.

Kändler, R. *see* Bückmann, A.

Kang, L. W. *see* Russell, F. E.

Kanoh, Y. Notes on the mechanism of monospermic fertilization in fish eggs. J. Fac. Sci. Hokkaido Univ. (Zool.) **13** 1957 : 394-398.

Kapoor, B. G. (1). The digestive tube of an omnivorous Cyprinoid fish, *Barbus stigma* (Cuv. & Val.). Jap. J. Ichth. **6** 1957 : 48-53 21 figs.

Kapoor, B. G. (2). A study on the tongue of fishes. Jap. J. Ichth. **6** 1957 : 82-86 6 figs.

Kapoor, B. G. (3). The morphology and histology of the alimentary tract of a plankton feeder, *Gadusia chapra* (Hamilton). Ann. Mus. Stor. nat. Genova **70** : 8-32 15 figs.

Kapoor, B. G. (4). The anatomy and histology of the digestive tract of a cyprinoid fish, *Catla catla* (Hamilton). Ann. Mus. Stor. nat. Genova **70** : 100-115 23 figs.

Kapoor, B. G. *see* Satô, M.

Karamchandani, S. J. *see* Motwani, M. P.

Karaman, S. L. The Radika River trout. Folia balcan. **1** 1957 : 57-70. [English summary.]

Karapetkova, M. S. *see* Martino, C. V.

Karatajū, A. *Asterolepis ornata* Eichwald ventralines šarvo puses rekonstrukcija. Darb. biol. Inst. Vilnius (B) **3** 1957 : 89-95 5 figs. [Russian with Lithuanian summary.]

(Karatayute, V. N.). [Reconstruction of the ventral part of the shield of *Asterolepis ornata* Eichwald.] Trud. Akad. Nauk Litovskoi SSR **3B** 1957 : 89-95 5 figs. [In Russian.]

Karlovac, J. Investigations on the larvae and postlarvae of the sardine (*Sardina pilchardus* Walb.) in the open waters of the Adriatic Sea. Izv. Inst. Oceanogr. Ribarst. **4** 4D : 1-24 15 figs.

Karlovac, J. *see* Gamulin, T.

Kasahara, S. Marking experiment on the glass-eel of *Anguilla japonica*. Rec. Res. Fac. Agric. Univ. Tokyo No. 6 (1955-56) 1957 : 66.

(Kasumov, A. G.). [Food and growth rate in ponds of *Vimba vimba natio carinata* and *Chalcalburnus chalcoides schischkovi*.] Doklady Akad. Nauk Azerb. S.S.R. **12** 1956 : 723-730. [In Azerbandzhan with Russian summary.]

Katada, M. *see* Zama, K.

Katayama, M. (1). On some rare fishes from Izu-Oshima, Japan. Jap. J. Ichth. **6** 1957 : 147-152 4 figs.

Katayama, M. (2). Four new species of Serranid fishes from Japan. Jap. J. Ichth. **6** 1957 : 153-159 4 figs.

Katayama, T. *see* Tsukuda, H.

Kaushiva, B. S. A preliminary note on Hilsa fisheries of Uttar Pradesh. J. Asiat. Soc. (Sci.) **20** 1954 : 45-46 1 pl.

Kawabata, T. & others. A report of a series of recent outbreaks of unusual Cephalopod and fish intoxications in Japan. Amer. J. trop. Med. Hyg. **6** 1957 : 935-939.

Kawai, Y. *see* Nakamura, M.

Kawanabe, H. & others (1). Population density of a salmon-like fish, *Plecoglossus altivelis*, or Ayu, in different river beds. Bull. jap. Soc. sci. Fish., **23** 1957 : 430-434. [Japanese with English summary.]

Kawanabe, H. & others (2). Ecology of natural stock of salmon-like fish, Ayu. II. The mode of life in relation to density. Physiol. & Ecol., Kyoto **7** 1957 : 145-167 17 figs. [English summary.]

Keddis, M. N. On the intestinal enzymes of *Tilapia nilotica* Boul. Proc. Egypt. Acad. Sci. **12** 1957 : 21-37 6 figs.

Keenleyside, M. H. A. *see* Hoar, W. S.

Keiz, G. *see* Brunner, G.

Keleher, J. J. & Kooyman, B. Supplement to Hink's "The fishes of Manitoba." Studies Fish. Res. Bd. Can. 1957 FRB No. 481 : 105-117. [reprint].

Kelkar, C. N. *see* Kalawar, A. G.

Kelly, J. W. *see* Becker, E. L.

Kennedy, D. & Milkman, R. D. Selective light absorption by the lenses of lower vertebrates, and its influence on spectral sensitivity. Biol. Bull. Woods Hole **111** 1956 : 375-386 5 figs.

Kennedy, M. Porbeagle, *Lamna cornubica* (Gmelin), in Irish waters. Irish Nat. J. 12 1957 : 120-122.

Kennedy, M. see Healy, A.

Kersey, L. R. see Andrew, F. J.

Kerswill, C. J. Effects of DDT spraying in New Brunswick on future runs of adult salmon. Stud. Fish. Res. Bd. Can. 1958 No. 525. [reprinted from Atl. Advocate 48 No. 8 : 65-68.]

Kessel, D. Paradise of Paradox (Ceylon). Life International May 26 : 1 [sep. pag.]

Ketchen, K. S. see Phillips, J. B.

Kewalramani, H. G. & Chhapgar, B. F. Occurrence of a rare sting ray [*Taeniura melanospila*] (Bleeker) in Bombay waters. J. Bombay nat. Hist. Soc. 54 1957 : 770-773 1 pl. 1 fig.

Khan, W. M. see Nagar, S. K.

Kharatishvili, G. D. Fauna Sakaraul'skogho ghorizonta i ee vozrast. Monog. Inst. Geol. Min. Akad. Nauk Gruz. SSR. 4 1952 : 1-278 32 pls.

Kibbat, F. Meine vielfarbigen Maulbrüter, *Haplochromis multicolor*. Aquar. Terrar. Z. 11 : 135-136 1 fig.

Kikuchi, R. see Hirao, S.

Kikuchi, T. & others. Polarographic studies of proteins contained in fish. Preliminary report. Bull. jap. Soc. sci. Fish. 23 1957 : 467-470. [Japanese with English summary.]

Killick, S. R. The chronological order of Fraser River sockeye salmon during migration, spawning and death. Bull. int. Pacif. Salm. Fish. Comm. No. 7 1955 : 1-95 29 figs.

Kimura, M. Early development of the mud skipper, *Periophthalmus cantonensis* (Osbeck). Bull. jap. Soc. sci. Fish. 23 : 754-757 2 figs.

Kirchhoff, H. Funktionell-anatomische Untersuchung des Visceralapparates von *Clupea harengus* L. Zool. Jb. (Anat.) 76 : 461-540 63 figs.

Kirtisinghe, P. The vertebral column of the flatfish *Psettodes erumei* (Bloch and Schneider). Ceylon J. Sci. Biol. Sci. N.S. 1 1957 : 67-72 1 pl. 4 figs.

Klausewitz, W. (1). Die Stellung der Systematik in der modernen Ichthyologie. Vivaristik 12 1957 : [1-7].

Klausewitz, W. (2). *Puntius lateristriga* und *Puntius zelleri*. Aquar. Terrar. Z. 10 1957 : 290-292 figs. 1-3.

Klausewitz, W. (3). Der Strahlen-Feuerfisch, *Pterois radiata*, eine interessante Neueinführung. Aquar. Terrar. Z. 11 : 48-51 2 figs.

Klausewitz, W. (4). Im Reiche der Korallenfische V. Xarifa-Reise zum Roten Meer und Indischen Ozean. Aquar. Terrar. Z. 11 : 366-369 2 figs.

Klausewitz, W. (5). Fische aus dem Atlantik und Pasifik. Senckenbergiana biol. 39 : 57-84 7 figs.

Klausewitz, W. (6). Lauterzeugung als Abwehrwaffe bei der hinterindischen Tigerschmerle (*Botia hymenophysa*). Natur. u. Volk 88 : 343-349 4 figs.

Klinger, K. Natriumnitrit, ein langsamwirkendes Fischgift. Schw. Z. Hydrol. 19 1957 : 565-578 13 figs.

Knobloch, A., Matsudaira, H. & Vendrely, R. Étude biochimique comparée de désoxyribonucléo-protéines isolées des spermatozoïdes de quelques espèces de poissons. C.R. Acad. Sci. Paris 246 : 2679-2682 1 fig.

Kobayashi, H. (1). Studies on the intergeneric crossings between 3 kinds of loach in Hokkaido, *Misgurnus anguillicaudatus* (Cantor). *Barbatula toni oreas* (Jordan & Fowler) and *Lefua nikkonis* (Jordan & Fowler). Jap. J. Ichth. 6 1957 : 160-169 2 pls. 1 fig.

Kobayashi, H. (2). On the colour variations of the mud loach, *Misgurnus anguillicaudatus* J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 63-66 1 pl. 2 figs.

Kobayashi, H. (3). Notes on retinomotor phenomena in some fishes under the various light conditions. J. Shimomoseki Coll. Fish. 7 (1) 1957 : 169-177 8 figs.

Kobayashi, H. (4). Studies on the scales of Scorpaenoid fishes. I. On the cycloid scales found in Scorpaenidae. Bull. jap. Soc. sci. Fish. 23 : 749-753. [Japanese with English summary.]

Kobayashi, H. & Hayasi, T. Preliminary studies on scale arrangement of Japanese fishes. Bull. jap. Soc. sci. Fish. 24 : 416-421. [Japanese with English summary.]

Kobayashi, H. & Moriyana, S. On the development of a loach, *Barbatula toni oreas* (Jordan & Fowler). Jap. J. Ichth. 6 1957 : 177-183 2 pls.

Kobayashi, H. & Yamabayashi, I. On the acceleration of spawning in a loach, *Misgurnus anguillicaudatus* (Cantor) by injection of the hypophyses of the same species. Jap. J. Ichth. 6 1957 : 170-176 1 fig. [English summary.]

Kobayashi, K. (1). Larvae and young of the sablefish *Anoplopoma fimbria* (Pallas), from the sea near the Aleutian Islands. Bull. jap. Soc. sci. Fish., 23 1957 : 376-382 2 figs. [Japanese with English summary.]

Kobayashi, K. (2). Larvae and young of the Atka mackerel *Pleurogrammus monopterygius* (Pallas) in the North Pacific. Bull. Fac. Fish. Hokkaido 8 : 297-303 2 figs. [Japanese with English summary.]

Kobayashi, S. see Hirata, H.

Kobayashi, T. An ecological study on the Salmon fry, *Oncorhynchus keta* (5). The behaviour of chum salmon fry to their seaward migration. Sci. Rep. Hokkaido Salmon Hatchery No. 12 : 21-30. [Japanese with English summary.]

Kobayashi, Y. see Takagi, K.

Kocylowski, B. Experimentelle Untersuchungen über die austeckende Bauchwassersucht der Karpfen und die Massnahmen zur Bekämpfung dieser Krankheit in der Polnischen Volksrepublik. Z. Fisch. 7 : 439-446.

Kodama, Y. Studies on the specific growth of freshwater fishes referring to the weight increase of individual and population. I. Variation of the specific growth and the relation between the average and individual specific growth by a small population of the brown trout (*Salmo trutta* L.) reared in pond. Bull. jap. Soc. sci. Fish. 24 : 435-440. [Japanese with English summary.]

Koefoed, E. Isospondyli. 2. Heterophotodermi. 1. from the "Michael Sars" North Atlantic Deep Sea Expedition 1910 (with addenda and corrigenda and Isospondyli 1.). Rep. Sars N. Atl. Deep Sea Exped. 4 2 no. 6 1-7 1 pl. 1 fig.

Koenig, O. Ein Beitrag zur Fortpflanzungsbiologie von *Dascyllus trimaculatus*. Aquar. Terrar. Z. 11 : 107-111.

Kohler, A. C. The validity of otolith age determinations for haddock (*Melanogrammus aeglefinus* L.) from the Lockeport, N.S., area. J. Fish Res. Bd. Can. 15 : 1229-1238 5 figs.

Kohler, A. C. & Clark, J. R. Haddock scale-otolith comparisons. J. Fish. Res. Bd. Can. 15 : 1239-1246.

(Kokhnenko, S. U.) [Tests on rearing eels in carp ponds of Belorussia.] Izv. Akad. Nauk Belorus. SSR 6 1955 : 101-105. [In Russian.]

Kolb, E. see Brunner, G.

Koli, L. Über *Cottus gobio* L. und *C. gobio kosheunickowi* Gratzianow in Finnland und in Schweden. Arch. Soc. zool. bot. fenn. 'Vanamo' 12 : 108-112 2 figs.

Koltzer, I. Leibeshöhlenverhältnisse der Linksformen von *Pleuronectes platessa* L. und *Pleuronectes flesus* L. Z. Fisch. 6 N.F., 1957 : 589-595 11 figs.

Kondo, K. Studies of the anchovy scale—I. Difference in the scale characters from various body areas, with a consideration on ecological significance of the grooves. Bull. Tokai Fish. Res. Lab. No. 17 1957 : 15-25 2 figs.

Kondo, K. see Hayashi, S.

Konishi, J. (1). A clue to the investigation of the control of breathing in fish by means of electrical activity in the muscle located on the regions of the gills. Rep. Fac. Fish. Univ. Mie 2 1957 : 347-352.

Konishi, J. (2). Respiratory reflex response in fish. Rep. Fac. Fish. Univ. Mie 2 1957 : 353-358 5 figs.

Konishi, J. (3). Electrical response of visual centre to photic stimulation in light-adapted fish *Carassius auratus* (L.), especially response from different areas of tectum opticum and effect of local application of drug. Zool. Mag., Tokyo 66 1957 : 428-434 7 figs.

Konishi, J. (4). Electrical response of visual centre to photic stimulation, especially in dark-adapted fish, *Carassius auratus* (L.). Zool. Mag., Tokyo 66 1957 : 435-438 4 figs.

Konishi, J. (5). Retinal response and its relation to electrical response of visual centre of the fish, *Carassius auratus* L. Zool. Mag., Tokyo **67**: 88-94 8 figs. [Japanese with English summary.]

Konstantusov, K. G. & Shchegolev, U. D. *Myxine glutinosa* of the Iceland shores. Zool. Zh. **37**: 1745. [Russian with English summary.]

Kooyman, B. see Keleher, J. J.

Kopac, M. J. see Greenberg, S. S.

Kornetsky, C. see Evans, L. T.

(**Koshelev, B. V.**). [Certain data on the biology of reproduction of carp in the Volga estuary.] Zool. Zh. **36** 1957: 1217-1227 5 figs. [In Russian with English summary.]

Koyama, H. see Nakamura, K.

(**Krainshkina, L. S.**). [A histophysiological description of the organs of the alimentary system in larvae of *Acipenser stellatus* Pallas at various stages of their development.] C.R. Acad. Sci. URSS **117** 1957: 542-544. [In Russian.]

Krassukova, S. V. Histological changes of mucous membrane of carp bowels in connection with the compound of food during the early stages of postembryogenesis. Vestn. Leningrad. Univ. No. 3 Biol. No. 1: 131-141 5 figs. [English summary.]

Krauter, D. Experimentelle Untersuchungen über das Interrenalorgan von Knochenfischen. Roux Arch. Entwickl.-Mech. Organ. **150**: 607-637 12 figs.

Kreff, G. see Bückmann, A.

Krishnamoorthi, K. P. A comparative study of protein-bound amino acids in the ovary and pituitary of *Mystus seenghala* (Sykes). J. zool. Soc. India **9** 1957: 153-161.

Krishnamurthi, B. & others. An investigation of large-scale fish mortality in a temple tank in Madurai. Proc. Indian Acad. Sci. **45B** 1957: 165-175.

Kruckow, T. (1). Die Bedeutung der versteinerten Haifischzähne. Der Aufschluss **11** 1957: 247.

Kruckow, T. (2). Beitrag zur miozänen Fisch-Fauna der Florida-Phosphate. Veröff. Überseemus. Bremen **3A**: 79-84.

Krumholz, L. A. Relative weights of some viscera in the Atlantic marlins. Bull. Amer. Mus. nat. Hist. **114**: 402-405.

Krumholz, L. A. & DeSilva, D. P. Some foods of marlins near Bimini, Honduras. Bull. Amer. Mus. nat. Hist. **114**: 406-411.

Krykhtin, M. L. Peculiarities of the spawning migrations of *Oncorhynchus masu* (Brevoort) and methods of obtaining its mature gonad products. Zool. Zh. **37**: 1694-1700.

Kublickas, A. Ungurio mityba Kursiu mariose. [The food of eels in Kurshyu-Mares Bay.] Darb. biol. Inst. Vilnius **2B** 1957: 167-175.

Kubo, I. & others. On vertebral counts of the Japanese anchovy of the Tokyo Bay and its adjacent waters. Misc. Rep. Res. Inst. nat. Resour. Tokyo No. 36 1954: 9-18 2 figs. [English summary.]

Kubo, T. A note on the age and race of the red salmon in the North Pacific Ocean. Bull. Fac. Fish. Hokkaido **8**: 304-309. [Japanese with English summary.]

Kubota, S. S. Histo-pathological studies on the hyaline droplets degeneration in the liver of rainbow trout, *Salmo irideus* Gibbons. I & II. Bull. Jap. Soc. Sci. Fish. **21** 1955: 164-170 2 figs. [Japanese with English summary.]

Kubota, S. S. see Okada, Y.

Kubota, Z. & others. Studies on the reproduction of the loach, *Misgurnus anguillicaudatus* (Cantor). I. The influence upon the productivity due to the size of fry. II. On the influence of the loach population density upon the productivity of pond. J. Shimonsaki Coll. Fish. **7** (1) 1957: 121-127 & 129-139 10 figs.

Kuenzer, P. (1). Zur Brutpflege von *Apistogramma reitzigi*. Aquar. Terrar. Z. **11**: 46-48.

Kuenzer, P. (2). Die Maulbrutpflege von *Betta taeniata*. Aquar. Terrar. Z. **11**: 324-326 text-figs. 1-8.

Kuenzer, P. *see* Butz, E.

Kuhn, G. D. *see* Halstead, B. W.

Kulkarni, C. V. *Hilsa ilisha* (Ham.) on the west coast of India. J. Asiat. Soc. 30 : 47-53 1 pl. map.

Kulkarni, R. S. *see* Marathe, V. B.

Kunimine, I. *see* Hoshina, T.

Kuroda, N. (1). On the life colours of some fishes VI & VII. Jap. J. Ichth. 6 1957 : 94-104 5 figs. 7 : 25-31 5 figs. [English summary.]

Kuroda, N. (2). Additions and corrections to the fishes of Suruga Bay. Zool. Mag., Tokyo 66 1957 : 461-463 3 figs.

Kurogane, K. & Hiyama, Y. (1). Morphometric comparison of the yellowfin tuna taken from the Equatorial Pacific. Bull. jap. Soc. sci. Fish. 23 1957 : 388-393. [Japanese with English summary.]

Kurogane, K. & Hiyama, Y. (2). Morphometric comparison of the yellowfin tuna from six grounds in the Indian Ocean. Bull. jap. Soc. sci. Fish. 24 : 487-494.

Kurogane, K. & Hiyama, Y. (3). Morphometric characteristics of the albacore, *Germo germo*, from the Northwest Pacific. Rec. oceanogr. Wks. Japan N.S. 4 1957 : 67-75.

Kurogane, K. & Hiyama, Y. (4). Morphometric comparison of the albacore from the Northwest to Equatorial and the Southwest Pacific. Rec. oceanogr. Wks. Japan N.S. 4 : 200-209 1 fig.

Kuroki, T. Biophysical studies on the auditory characteristic of fish. I. Directional audibility through one lateral line. Bull. jap. Soc. sci. Fish. 23 1957 : 400-404. [Japanese with English summary.]

Kusa, M. Occurrence of a neutral mucopolysaccharide in the cortical alveoli of lamprey eggs. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 455-457 2 figs.

Kusminskaya, G. N. Sensory innervation of the pike perch's tract. Vestn. Leningr. Univ. 1958 : 66-72 6 figs. [English summary.]

Kuthalingam, M. D. K. Life history and feeding habits of *Cynoglossus lingua* (Ham. Buch.). J. zool. Soc. India 9 1957 : 208-215 10 figs.

Kutkuhn, J. H. Utilization of gizzard shad by game fishes. Proc. Iowa Acad. Sci. 65 : 571-579.

Kux, Z. Beitrag zur Kenntnis der Ichthyofauna in Donaugebiet der ČSR. Čas. Moravsk. Mus. 42 1957 : 67-84 20 figs. map. [German summary.]

Kux, Z. & Libosvsky, J. Zur Verbreitung und Rassenzugehörigkeit der Europäischen Hundsische (*Umbra krameri* Walbaum 1792 = *lacustris* Gross 1794). Zool. Listy 6 1957 : 215-224 1 pl.

Kux, Z. & Weisz, T. Ein Beitrag zur Erforschung der Ichthyofauna im Jopla-Fluss, Bezirk Bardejov. (Nordostslowakei). Čas. moravsk. Mus. Sci. nat. 43 : 145-174 6 pls. map. [German summary.]

Kux, Z. *see* Libosvsky, J.

(Kuzmenko, K. N.). [How pike swallow their prey.] Priroda 1 : 115.

Kyushin, K. On the growth of "Hokke," *Pleurogrammus azonus* Jordan et Metz, considered on the basis of length distribution. Bull. Fac. Fish. Hokkaido 8 1957 : 190-194.

Ladiges, W. (1). Der Malaiische Gurami *Sphaerichthys osphromenoides* Canestrini. Aquar. Terrar. Z. 11 : 3-7 figs.

Ladiges, W. (2). Eine vierte, neue Art der Gattung *Pterolebias* von Cabo Frio, Rio de Janeiro. (Vorläufige Mitteilung). Aquar. Terrar. Z. 11 : 76-77 1 fig.

Ladiges, W. (3). Bemerkungen zu einigen Neuimporten. Aquar. Terrar. Z. 11 : 203-204 2 figs.

Ladiges, W. (4). *Teleogramma gracile* Boulenger, der Quappenbuntbarsch. Aquar. Terrar. Z. 11 : 229-230.

Lage, C. Da (1). Innervation neuro-sécrétoire de l'adénohypophyse chez l'hippocampe. C.R. Ass. Anat. 41 1954 : [1-5]. *See* Bull. Soc. biol. Arcachon N.S. No. 8 1956 : 1-5 [sep. pag.]

Lage, C. Da (2). Étude supravitale de l'hippocampe en microscopie à contraste de phase. C.R. Ass. Anat. 42 [1955] : 1454-1459 6 figs. *See* Bull. Sta. biol. Arcachon N.S. No. 9 1957 : 1454-1459.

Lagler, K. F. & Vallentyne, J. R. Fish scales in a sediment core from Linsley Point, Connecticut. *Science* **124** 1956 : 368 2 figs.

Lahaye, J. *see* Doumenge, F.

Lake, J. S. Trout populations and habitats in New South Wales. *Aust. J. mar. freshw. Res.* **8** 1957 : 414-450 2 pls. 9 figs.

Lakshman, A. B. *see* Ramaswami, L. S.

Lambert, J. G. Poissons Siluriformes et Cyprinodontiformes récoltés en Guinée Française, avec la description d'une nouvelle espèce de *Microsynodontis*. *Rev. Zool. Bot. afr.* **57** : 39-56 7 figs.

Lambert, J. *see* Poll, M.

La Monte, F. R. (1). Scales of the Atlantic species of *Makaira*. *Bull. Amer. Mus. nat. Hist.* **114** : 381-395 8 pls. 8 figs.

La Monte, F. R. (2). Notes on the alimentary, excretory and reproductive organs of Atlantic *Makaira*. *Bull. Amer. Mus. nat. Hist.* **114** : 396-401 6 figs.

Landa, A. *see* Howard, G. V.

Lanfranco, G. G. A complete guide to the fishes of Malta. *Malta* : 1-74 41 pl.

Lantz, A. W. & Gunasekera, C. Chemical analysis of some Ceylon fishes. *Bull. Fish. Res. Sta. Ceylon* No. 5 1957 : 34 pp. 30 figs.

Larmie, F. M. *see* Orange, C. J.

Larrañeta, M. G. (1). Presence of *Peroderma cylindricum* Heller parasite on sardines of the Castellon and Alicante coasts. *Proc. Fish. Counc. Mediterr. F.A.O.* **4** 1957 : 109-112.

Larrañeta, M. G. (2). Sur la formule vertébrata de quelques poissons commerciaux des côtes de Castellon. *Rapp. Comm. int. Mer. Médit.* **14** : 373-377.

Larrañeta, M. G. & Lopéz, J. The growth of the Castellon coast sardine (*Sardinia pilchardus* Walb.). *Proc. Fish. Counc. Mediterr. F.A.O.* **4** 1957 : 101-108.

La Tourrasse, G. de. *see* Tourrasse, G. de La.

Laurent, P. (1). Mode de terminaison et signification fonctionnelle des fibres myelinisées innervant sans relais ganglionnaire le tissu musculaire de l'oreillette des Téléostéens. *C.R. Acad. Sci. Paris* **243** 1956 : 534-536.

Laurent, P. (2). Le rôle de la région sino-auriculaire dans le fonctionnement cardiaque chez les téléostéens. *Physiol. Comp.* **4** 1957 : 346-356 4 figs.

Laurent, P. (3). L'innervation auriculaire du coeur des téléostéens. *Arch. Anat. micr. Morph. exp.* **46** : 503-520 15 figs.

Lawler, G. H. Variation in number of dorsal spines in the brook stickleback, *Eucalia inconstans*. *Canad. J. zool.* **36** : 127-129 1 fig.

Lawler, G. H. & Watson, N. H. F. Limnological studies of Heming Lake, Manitoba and two adjacent lakes. *J. Fish. Res. Bd. Can.* **15** : 203-218.

Lazarow, A. & others. Studies on the isolated islet tissue of fish. II. The effect of electrolytes and other factors on the oxygen uptake of pancreatic islet slices of toadfish, using the cartesian diver microrespirometer. *Biol. Bull. Woods Hole* **113** 1957 : 414-425 3 figs.

(Lebkova, N. P.). [The development of eye in *Petromyzon*, as related to certain peculiarities of its ecology.] *C.R. Acad. Sci. URSS* **118** : 845-848 3 figs. [In Russian.]

Le Cren, E. D. (1). Observations on the growth of perch (*Perca fluviatilis* L.) over twenty-two years with special reference to the effects of temperature and changes in population density. *J. Anim. Ecol.* **27** : 287-334 17 figs.

Le Cren, E. D. (2). Preliminary observations on populations of *Salmo trutta* in becks in Northern England. *Verh. int. Ver. Limnol* **13** : 754-757 1 fig.

Le Cren, E. D. (3). The application of science to inland fisheries: a review of the biological basis of freshwater fisheries. *FAO Fish. Study* No. 8 : pp. [vi], 52.

Le Cren, E. D. *see* Frost, W. E.

Le Danois, Y. Sur la transformation d'une bouche protractile en museau tubulaire suceur chez les Poissons coralliens et littoraux. C.R. Acad. Sci. Paris **247** : 1400-1402 3 figs.

Lee, A. J. *see* Hill, H. W.

Legait, E. & H. Recherches sur l'ultrastructure de l'hypophyse de quelques Téléostéens. C.R. Soc. Biol. Paris **152** : 130-133.

Legait, H. La vascularisation du lobe distal de l'hypophyse des Téléostéens comparée à celle des autres Vertébrés. C.R. Soc. Biol. Paris **151** : 1940-1943.

Legait, H. & E. Terminaisons neuro-sécrétoires au niveau de l'adénohypophyse chez quelques Téléostéens. Étude au microscope électronique. C.R. Soc. Biol. Paris **151** : 1943-1946.

Legaré, J. E. H. *see* Tibbo, S. N.

Legault, R. A technique for controlling the time of daily spawning and collecting of eggs of the zebra fish, *Brachydanio rerio*. Copeia **1958** : 328-330 2 figs.

Lehmann, W. Zum ersten Mal gezüchtet : *Xenochara dolichoptera* Kner. Aquar. Terrar. Z. **11** : 326-329 2 text-figs.

Leiner, M. & Schmidt, D. The histology of the Islet-system in the pancreas of the lungfish *Protopterus annectens* Ow. Photogr. Forsch. **7** 1957 : 129-138 17 figs.

Leleup, N. *see* Heuts, M. J.

Leleup, J. (1). Influence de "l'estivation" sur le fonctionnement thyroïdien du Protoptère (*Protopterus annectens* Owen). C.R. Acad. Sci. Paris **246** : 830-833.

Leleup, J. (2). Influence de la température sur le fonctionnement thyroïdien de l'Anguille normale. C.R. Acad. Sci. Paris **247** : 2454-2456 1 fig.

Lennon, R. E. *see* Parker, P. S.

Leonte, V. & Munteanu, Gh. I. Contributuni la studiul biologiei gincrii *Clupeonella delicatula delicatula* Nordmann. Bul. Inst. Cercet. Pisc. Roman **16** No. 4 1957 : 37-46.

Leonte, V. *see* Radulescu, I.

Leriche, M. Les poissons Néogènes de la Bretagne de l'Anjou et de la Touraine. Mém. Soc. géol. Fr. Paléont. **81** : 1-64 4 pls. map.

Lewis, W. H. & Charles, E. Flotation of fishes following stunning by electrical shock. Trans. Ill. Acad. Sci. **50** : 38-40.

Lewis, W. M. The fish population of a spring-fed stream system in southern Illinois. Trans. Ill. Acad. Sci. **50** : 23-29 1 fig.

Lewis, W. M. *see* Gunning, G. E.

Li, M. *see* Wang, Y.

Libosvářský, J. On the ecology and reproduction of the stone-loach *Nemachilus barbatulus* (L.). Zool. Listy **6** 1957 : 367-388 2 figs.

Libosvářský, J. & Kux, Z. Beitrag zur Kenntnis der Bionomie und Nahrung des Hundfisches, *Umbra krameri krameri* (Walbaum). Zool. Listy **7** : 235-248 2 pls. 3 figs.

Libosvarsy, J. *see* Kux, Z.

Lindbergh, G. U. (1). The origin of the fauna of typically fresh water fishes in the Japanese Sea basin. Bull. Soc. nat. Moscou Sect. Biol. N.S. **52** No. 3 1947 : 11-27 map. [Russian with English summary.]

Lindbergh, G. U. (2). Nekotoriue rezul'tatui resheniya paleogeograficheskikh problem biogeograficheskim metodom. Voprosui Paleobiogeografii i biostratigraphii. Trudui I sessii Vsesoyuznogho Paleontologicheskogho Obshchestva 1957 : 107-124.

Linder, A. D. Behaviour and hybridization of two species of *Etheostoma* (Percidae). Trans. Kansas Acad. Sci. **61** : 195-212 2 pls.

Lindsey, C. C. Modification of meristic characters by light duration in kokanee, *Oncorhynchus nerka*. Copeia **1958** : 134-136.

Ling, J. K. The sea garfish, *Reporhamphus melanochir* (Cuvier and Valenciennes) (*Hemiramphidae*), in S. Australia: breeding, age determination, and growth rate. Aust. J. mar. freshw. Res. **9** : 60-110 20 figs.

Lissmann, H. W. (1). On the function and evolution of electric organs in fish. J. exp. Biol. **35** : 156-191 2 pls. 12 figs.

Lissmann, H. W. (2). Electric organs in fish: their function and evolution. *New Scient.* 4 : 346-348 2 figs.

Lissman, H. W. & Machin, K. E. The mechanism of object location in *Gymnarchus niloticus* and similar fish. *J. exp. Biol.* 35 : 451-486 21 figs.

Liu, H. On a new Triassic Dictyopygid fish from Sunkiang, China. *Vertebrata Palasiatica* 2 : 147-150 1 pl.

Liu, H. *see* Chou, H.

Liu, T. S. & P'an, K. Devonian fishes from Wutung Series near Nanking, China. *Palaeont. sinica* C.15, 1-41 10 pls. figs.

Ljubica, N. *see* Feja, F.

Loas, V. Plancton et squales. *Rev. Trav. Off. Pêches marit.* 22 : 333-335 1 fig.

Longhurst, A. R. (1). The food of the demersal fish of a West African estuary. *J. Anim. Ecol.* 26 1957 : 369-387 4 figs.

Longhurst, A. R. (2). Racial differences in size and growth in the New Zealand snapper. *N.Z. J. Sci.* 1 : 487-499 5 figs.

Lopéz, J. *see* Larrañeta, M. G.

Lorec, Z. Blue-acara *Aequidens latifrons* (Steindacher) and its breeding. *Przegl. zool.* 1 1957 : 334-340. [In Polish, English summary.]

Lowe, R. H. (1). The breeding behaviour of *Tilapia* species (Pisces; Cichlidae) in natural waters, observations on *T. karomo* Poll and *T. variabilis* Boulenger. *Behaviour* 9 1956 : 140-163 3 pls. 3 figs.

Lowe, R. H. (2). Observations on the biology of *Tilapia nilotica* Linné in East African waters. *Rev. Zool. Bot. afr.* 57 : 129-170 5 figs.

Lozano Cabo, F. (1). Notes on the biology and fishing of Tuna. *Proc. Fish. Coun. Mediterr. F.A.O.* 4 1957 : 113-125.

Lozano Cabo, F. (2). Contribución al conocimiento del "fartet" (*Aphanius iberus* C. & V). *Rev. Acad. Cienc. Madrid* 52 : 585-607 5 figs.

Lozano Cabo, F. (3). Los Escómbridos de Las Aguas Españolas y Marroquies y su Pesca. Primera Parte. *Trab. Inst. esp. Oceanogr. No.* 25 : 6-254 187 figs.

Luft, J. H. The histology and cytology of the electric organ of the electric eel. (*Electrophorus electricus*, L.). *J. Morph.* 100 1957 : 113-139 20 figs.

Luffy, R. G. *see* Al-Hussaini, A. H.

Lühmann, M. & Mann, H. (1). Über Organgewichte bei Karpfen. *Arch. Fisch. Wiss.* 8 1957 : 1-11.

Lühmann, M. and Mann, H. (2). Wiederfänge markierter Elbaale vor der Küste Dänemarks. *Arch. Fisch. Wiss.* 9 : 200-202 2 figs.

Lukacsovics, F. *see* Entz, B.

Lüling, K. H. (1). Zufallsbeobachtungen an *Tetraodon somphongsi* Klauswitz und *Gyrinocheilus aymonieri* (Tirant). *Aquar. Terrar. Z.* 11 : 11-15 text-figs. 1-4.

Lüling, K. H. (2). Ein interessanter Zug des Benehmens von *Periophthalmus barbarus* bei fallendem Wasserspiegel. *Aquar. Terrar. Z.* 11 : 172-174 3 figs.

Lüling, K. H. (3). Melanophorenschutz über dem Gehirn bei kleinen *Toxotes* und anderen Oberflächenfischen. *Bonn. zool. Beitr.* 8 : 302-303 3 figs.

Lüling, K. H. (4). Über die Atmung, amphibische Lebensweise und Futteraufnahme von *Synbranchus marmoratus*. *Bonn. zool. Beitr.* 9 : 1957 68-94 1 pl. 13 figs.

Lüling, K. H. (5). Morphologisch-anatomische und histologische Untersuchungen am Auge des Schützenfisches *Toxotes jaculatrix* (Pallas 1766) (Toxotidae), nebst Bemerkungen zum Spuckgehaben. *Z. Morph. Ökol. Tiere* 47 : 529-610 48 figs.

Lundin, S. J. On the location of cholinesterase in fishes. *Experientia* 14 : 131-132 4 figs.

Luscan, S. *see* Radulescu, I.

Luther, W. Symbiose von Fischen (Gobiidae) mit einem Krebs (*Alpheus djiboutensis*) im Roten Meer. *Z. Tierpsychol.* 15 : 175-177 3 figs.

Lutio, E. de *see* Chiaffi, G.

(Lyaiman, E. M.). [Diseases of fishes.] Moscow 1957 : 1-259 61 figs. [In Russian.]

- Macagnino, G.** *see* Antonaci, B. L.
- McBride, J. R.** *see* MacLeod, A.
- McCauley, R. W.** Thermal relations of geographic races of *Salvelinus*. *Canad. J. Zool.* **36** : 655-662 4 figs.
- McConnell, R. H.** [*see also* under Lowe, R. H.]. Introduction on the fish fauna of British Guiana. *Timehri* No. 37 : 25-35 3 figs.
- McCracken, F. D. (1).** Results of cod tagging off eastern Nova Scotia. *Progr. Rep. Atl. biol. Sta. No. 67* 1957 : 6-13 2 figs.
- McCracken, F. D. (2).** On the biology and fishery of the Canadian Atlantic halibut, *Hippoglossus hippoglossus* L. *J. Fish. Res. Bd. Can.* **15** : 1269-1311.
- McCrery, P.** *see* Aron, W.
- Macdonald, W. W.** Observations on the biology of Chaoborids and Chironomids in Lake Victoria and on the feeding habits of the "Elephant-snout fish" (*Mormyrus kannume* Forskål). *J. Anim. Ecol.* **25** 1956 : 36-53 6 figs.
- McFarland, W. N. & Munz, F. W.** A re-examination of the osmotic properties of the Pacific hagfish, *Polistotrema stouti*. *Biol. Bull. Woods Hole* **114** : 348-356.
- McFarland, W. N. & Norris, K. S.** The control of pH by buffers in fish transport. *Calif. Fish. Game* **44** : 291-310.
- MacGregor, J. S.** Fecundity of the Pacific sardine (*Sardinops caerulea*). *Fish. Bull. U.S.* **57** (121) 1957 : 427-449.
- Machin, K. E.** *see* Lissmann, H. W.
- Mackay, R. D.** Casting a fish in plaster. *Aust. Mus. Mag.* **12** 1957 : 153-155 4 figs.
- McKeever, K. L.** Albinism and ambicoloration in the California halibut. *Calif. Fish. Game* **44** : 171-174 2 figs.
- McKenney, T. W. & others.** Early development and larval distribution of the carangid fish, *Caranx crysos* (Mitchill). *Bull. mar. Sci. Gulf & Caribbean* **8** : 167-200 7 figs.
- McKenzie, R. A.** Age and growth of smelt, *Osmerus mordax* (Mitchill) of the Miramichi River, New Brunswick, J. *Fish. Res. Bd. Can.* **15** : 1313-1327.
- McKenzie, R. A. & Skud, B. E.** Herring migrations in the Passamaquoddy region. *J. Fish. Res. Bd. Can.* **15** : 1329-1343 7 figs.
- McKenzie, R. A. & Tibbo, S. N.** Herring tagging in the Bay of Fundy. *Progr. Rep. Atl. biol. Sta. No. 70* : 10-15 4 figs.
- MacLeod, A. & others.** Variations in the sodium and potassium content of muscle tissue of Pacific salmon with particular reference to migration. *Canad. J. Biochem. & Phys.* **36** : 1257-1268.
- Mainardi, D.** *see* Bocchi, G. D.
- Makings, P.** *see* O'Rourke, F. J.
- (Makushok, V. M.).** [Morphology and systematics of Stichaeidae, Blennioidei, Pisces]. *Trud. Inst. zool.* **25** : 3-129 83 figs. [In Russian, with separate English translation.]
- (Malinovskaya, N. S.).** [Feeding of fish in Dzhzhkzansk water reservoir.] *Sborn. Rabot. Ikhtiol. Ghidrobiol.* **1** 1956 : 74-93 fig. [In Russian.]
- Manacop, P. R.** The life history and habits of the goby, *Sicyopterus extraneus* Herre (Anga) Gobiidae, with an account of the goby-fry fishery of Cagayan river, Oriental Misamis. *Philipp. J. Fish.* **2** 1954 : 1-58 3 pls. 10 figs.
- Manfredi, P.** Cattura di un *Silurus glanis*, nell' Adda, presso Lecco. *Natura, Milano* **48** 1 1957 : 28-30 2 figs.
- Maniukas, J.** Kai kurie duomenys apie Lietuvos TSR ežerų lašišinės žuvis. *Darb. biol. Inst. Vilnius* **3B** 1957 : 153-167. [Russian with Lithuanian summary.]
- Mann, H.** *see* Lühmann, M.
- Mann, R. J.** *see* Miller, H. W.
- Manning, R. B.** *see* Robins, C. R.
- Mansfield, K.** Pike-perch in England. *Salm. Trout Mag. No. 153* : 94-98 1 fig.
- Manwell, C. A.** "foetal-maternal shift" in the ovoviviparous spiny dogfish *Squalus suckleyi* (Girard). *Physiol. Zool.* **31** : 93-100 2 figs.
- Marathe, V. B. & Bal, D. V. (1).** The development of the chondrocranium in *Trichopodus trichopterus* (Pall.). *Proc. Indian Acad. Sci.* **46B** 1957 : 347-375 18 figs.

Marathe, V. B. & Bal, D. V. (2). Observations on the development of the caudal skeleton in *Eleutheronema tetradactylum* (Shaw.) and *Trichopodus trichopterus* (Pall.). J. Univ. Bombay Biol. Ser. N.S. 25 3 1957 : 1-12 8 figs.

Marathe, V. B. & Bal, D. V. (3). A brief comparative account of the axial skeleton of six polynemids from Bombay waters. J. Univ. Bombay 26B : 139-151 5 figs.

Marathe, V. B. & Kulkarni, R. S. The circulatory system of *Ophicephalus striatus* Bloch. J. Univ. Bombay N.S. 25B 1957 : 29-40 6 figs.

Marchetti, R. Varianti morfologiche in due diverse popolazioni di *Eupomotis gibbosus* Lin. R.C. Ist. lombardo 92B : 291-300 5 figs.

Marckmann, K. The influence of the temperature on the respiratory metabolism during the development of the sea-trout. Medd. Danm. Fisk. Havundersøg. N.S. 2 No. 21 : 1-20 10 figs.

Marco, C. De & Antonini, E. Amino-acid composition of haemoglobin from *Thunnus thynnus*. Nature, Lond. 181 : 1128.

Markiewicz, Fr. see Dyszowska, L.

Markovic-Giaja, L. see Giaja, J.

Marlier, G. (1) L'enkystement du *Protopterus aethiopicus* Heckel. Ann. Soc. zool. Belg. 87 1957 : 211-216 1 fig.

Marlier, G. (2). Le Ndakala, poisson pélagique du lac Tanganika. Bull. Agric. Congo Belg. 48 1957 : 409-422 1 fig.

Marlier, G. (3). Recherches hydro-biologiques du lac Tumba (Congo Belg. Province de l'Equateur). Hydrobiologia 10 : 352-385 8 figs.

Marocco, R. Accrescimento e prove di alimentazione di *Mugil cephalus*. Atti Ist. veneto. Cl. Sci. Mat. Nat. 115 1957 : 117-126.

Marr, J. C. The "critical period" in the early life history of marine fishes. J. Cons. int. Explor. Mer 21 1956 : 160-170 4 figs.

Marshall, N. B. & Thines, G. L. Studies of the brain, sense organs and light sensitivity of a blind cave fish (*Typhlogarra widdowsoni*) from Iraq. Proc. zool. Soc. Lond. 131 : 441-456 4 figs. 1 pl.

Marshall, N. B. see Bertelsen, E.

Marshall, N. B. see Denton, E. J.

Martin, M. & Winks, B. A note on the algal food of three marine fish from Southern Queensland. Qd. Nat. 15 4-6 1956 : 79.

Martin, S. F. (1). Ictiologia del archipelago de los Roques. In Mendez, A. & others. El archipelago de los Roques y la Orchila. Caracas (Soc. Cien. Nat. La Salle) 1956 : 87-144 16 pls.

Martin, S. F. (2). Una nueva especie de Torpedinidae de Golfo de Cariaco, Edo. Sucre, Venezuela. Noved. Cient. Mus. Hist. Nat. la Salle No. 21 1957 : 1-4 2 figs.

Martin, S. F. (3). Nota sobre seis especies de peces de las costas de Venezuela. Mem. Soc. Cien. nat. La Salle 18 : 95-99 1 fig.

Martin, S. F. see Fernandez, A.

Martin, S. F. see Méndez, A. A.

(Martino, C. V. & Karapetkova, M. S.). [Étude quantitative des relations nutritives chez les poissons.] Zool. Zh. 36 1957 : 425-431. [In Russian with French summary.]

Marty, J. J. see Bückmann, A.

Maruyama, T. An observation on *Tilapia mossambica* in pond referring to the diurnal movement with temperature change. Bull. Freshw. Fish. Res. Lab. Tokyo 8 (1) : 25-32 3 figs.

Matei, C. see Banarescu, P.

Mather, F. J. & Gibbs, R. H. Distribution of the Atlantic bigeye tuna, *Thunnus obesus*, in the western North Atlantic and the Caribbean Sea. Copeia 1958 : 237-239.

Mathew, M. J. see Chacko, P. I.

Mathewson, R. & others. Morphology of main and accessory electric organs of *Narcine brasiliensis* (Olfers) and some correlations with their electrophysiological properties. Biol. Bull. Woods Hole 115 : 126-135 3 figs.

Mathias, P. & Salvy, J. La daurade du Bassin de Thau. Rapp. Comm. int. Mer Médit. 14 : 583-589 2 figs.

Mathieu, Y. La détermination du sexe chez quelques espèces de *Tilapia* d'élevage et chez *Hemichromis fasciatus* Ptrs. Ann. Soc. zool. Belg. 88 1957 : 369-372.

Matsubara, K. & Iwai, T. (1). A new Apogonid fish, *Siphamia majimai*. Ann. Mag. nat. Hist. (13) 1 : 603-608 3 figs.

Matsubara, K. & Iwai, T. (2). Anatomy and relationships of the Japanese fishes of the family Gempylidae. Mem. Coll. Agric. Kyoto Univ. Fish. Ser. Sp. No. : 23-54 14 figs.

Matsudaira, H. see Knobloch, A.

Matsue, Y. & others. Effect of an insecticide, parathion, on aquatic animals in the lower range than its lethal concentration. Bull. jap. Soc. sci. Fish., 23 1957 : 358-362. [Japanese with English summary.]

Matsui, I. On the records of a leptocephalus and catadromous eels of *Anguilla japonica* in the waters around Japan with a presumption of their spawning places. J. Shimonoseki Coll. Fish. 7 (1) 1957 : 151-167 1 pl. 6 figs.

Matsui, I. see Kubota, Z.

Matsumoto, W. M. Description and distribution of larvae of four species of tuna in Central Pacific waters. Fish. Bull. U.S. 58 (128) : 31-72 37 figs.

Matsushima, M. Spawning activity of wild gold-fish in Lake Sagami Reservoir, observed through the eggs deposited on "fish-nest" and the ovarian eggs. Bull. Freshw. Fish. Res. Lab. Tokyo 6 No. 1 1956 : 1-20 2 pls. [English summary.]

Matta, F. (1). L'accrescimento ponderale del merluzzo Mediterraneo (*Merluccius merluccius* L.). Boll. Pesca Piscic. Idrobiol. 32 1956 : 283-290.

Matta, F. (2). La sardina (*Sardina pilchardus* Walb.) del Mare Tirreno. Boll. Pesca Piscic. Idrobiol. 32 1956 : 291-296.

Matta, F. (3). Biometry of the sardine (*Sardina pilchardus* Walb.) of the Tyrrhenian Sea. Proc. Fish. Council. Mediterr. F.A.O. 4 1957 : 327-333.

Matta, F. (4). La croissance du merlu en Méditerranée. Rapp. Comm. int. Mer Médit. 14 : 355-358.

Matty, A. J. Occurrence of periodic acid—Schiff positive material in the pituitary of the parrot fish, *Pseudoscarnus guacamaia*. Nature, Lond. 180 1957 : 1055 2 figs.

Matveeva, A. A. Palaeoniscids from the Izuik-Chal horizon (L. Carboniferous) of the Minusinsk Basin. Vop. Iktologii. Akad. Nauk SSSR No. 11 : 154-161 6 pls.

(**Matveeva, R. P.**). [Food of young herring in Northern Caspian.] Trud. Gidrobiol. Obshch. 8 1957 : 368-386 6 figs. [In Russian.]

Maul, G. E. see Mead, G. W.

Maurin, C. see Audouin, J.

Maurin, C. see Furnestin, J.

Mauro, A. see Mathewson, R.

Mauteifel, Y. B. see Serbenyuk, T. V.

Maxfield, G. H. Record of a hatchery-reared rainbow trout, *Salmo gairdneri gairdneri*, with three pelvic fins. Copeia 1958 : 232.

(**Maxunov, V. A.**). [Certain data on morphology and biology of *Capoetobrama kuschakevitschi* (Kessler) of the river Syr-Darya.] Zool. Zh. 36 1957 : 238-245. [In Russian, English summary.]

May, M. M. & Herbert, E. C. Studies on the evolution of the coronary arteries. Proc. Pa Acad. Sci. 31 1957 : 161-171 7 figs.

Mayhew, J. The fish population of a southern Iowa artificial lake. Proc. Iowa Acad. Sci. 65 : 565-570 1 fig.

Mazumdar, N. N. On a collection of fishes from Delhi State. J. Bombay nat. Hist. Soc. 55 : 366-370.

Mazumdar, S. R. (1). A key to the identification of impregnated eggs of common fresh-water fishes of Bengal. Curr. Sci. 26 1957 : 125-126.

Mazumdar, S. R. (2). On the spawning habits and early development of *Wallagonia attu* (Bloch and Schneider). Proc. zool. Soc., Calcutta 10 1957 : 99-103 1 pl.

Mead, G. W. (1). A new species of iniomous fish from the Gulf of Mexico. J. Wash. Acad. Sci. 48 : 188-191 1 fig.

Mead, G. W. (2). Three new species of archibenthic iniomous fishes from the western North Atlantic. J. Wash. Acad. Sci. 48 : 362-372 4 figs.

Mead, G. W. (3). A catalog of the type specimens of fishes formerly in the collections of the Department of Tropical Research, New York Zoological Society. Zoologica, N.Y. 43 : 131-134.

Mead, G. W. & Böhlke, J. E. *Gobionellus stigmalophirus*, a new goby from the Gulf of Campeche and the Great Bahama Bank. *Copeia* 1958 : 285-289.

Mead, G. W. & Maul, G. E. *Taractes asper* and the systematic relationships of the Steinegeriidae and Trachybrycidae. *Bull. Mus. comp. Zool. Harv.* 119 : 393-417 1 pl.

Mehring, A. G. *see* Raney, E. C.

Meinken, H. (1). *Capoeta hulstaerti* (Poll) 1945, eine hübsche Neueinführung aus dem Kongo-Gebiet. *Aquar. Terrar. Z.* 10 1957 : 229-231 1 fig.

Meinken, H. (2). *Rasbora somphongsi* eine neue Zwergrasbora. *Aquar. Terrar. Z.* 11 : 67-69 1 fig.

Meinken, H. (3). *Hemigrammus ocellifer ocellifer* Steindachner und *Hemigrammus ocellifer falsus* n. subsp. *Aquar. Terrar. Z.* 11 : 230-232 1 fig.

Meinken, H. (4). *Bedotia geayi* Pellegrin 1907, der Rotgeschwänzte Ährenfisch, eine hübsche Neueinführung aus Madagaskar. *Aquar. Terrar. Z.* 11 : 355-357 1 photo.

Meinken, H. (5). *Rasbora somphongsi* nov. spec., eine neue Rasbora aus Siam. *Opusc. Zool. Nr.* 19 : 1-6 2 figs.

(Mekhanik, F. Y.). [On the problem of fish starvation.] *Zool. Zh.* 36 1957 : 1897-1900. [In Russian with English summary.]

Melouk, M. A. On the development of *Carcharinus melanopterus* (Q. et G.). *Publ. mar. Biol. Sta. Ghardaqa* No. 9 1957 : 229-251 24 figs.

Méndez, A. A. & Martin, S. F. Actividades pesqueras. El Archipelago de Los Roques y la Orchila, Caracas 1956 : 224-251 4 pls. 13 figs.

Mendoza, G. Adaptations during gestation in the viviparous cyprinodont teleost, *Hubbsina turneri*. *J. Morph.* 99 1956 : 73-96.

Menon, A. G. K. (1). Further observations on the fish fauna of the Manipur State. *Rec. Indian Mus.* 52 1955 : 21-26 1 fig.

Menon, A. G. K. (2). The external relationships of the Indian freshwater fishes, with special reference to the countries bordering on the Indian Ocean. *J. Asiat. Soc. (Sci.)* 21 1957 : 31-38 2 figs.

Menon, A. G. K. (3). *Garra ethelwynnae*, a new cyprinid fish from Eritrea (Africa). *Curr. Sci.* 27 : 450-451 1 fig.

Menon, M. A. S. Notes on fishes of the genus *Glyptothorax* Blyth. *Rec. Indian Mus.* 52 1955 : 27-54.

Menon, M. D. On some abnormal sharks preserved at the Marine Biological Station, West Hill. *J. zool. Soc. India* 9 1957 : 200-207 15 figs.

Menon, M. D. & Chacko, P. I. (1). Food and feeding habits of freshwater fishes of Madras State, India. *Proc. Indo-Pacif. Fish. Council, 6th Session* 1955 [1956] : 182-186.

Menon, M. D. & Chacko, P. I. (2). The food and feeding habits of some freshwater fishes of Madras State. *J. Bombay nat. Hist. Soc.* 55 : 117-124.

Menzies, W. J. M. & Shearer, W. M. Long-distance migration of Salmon. *Nature, Lond.* 179 1957 : 790.

Merckens, P. J. Zoetwater-Kogelvissen 2. Aquarium, Den Haag 29 : 106-109 6 figs.

Merlo, S. (1). Accrescimento e ciclo vitale della trota lacustre (*Salmo lacustris* L.) del Garda. *Boll. Zool.* 23 1956 : 349-358 1 pl.

Merlo, S. (2). Fisheries and restocking of the Lake of Garda with salmonid species. *Proc. Fish. Counc. Mediterr. F.A.O.* 4 1957 : 257-267 3 figs.

Miaskowski, M. Variabilitätsstudien an den Flossen der Cypriniden. *Arch. Fisch. Wiss.* 8 1957 : 32-53 7 figs.

Michaelson, J. *see* Russell, F. E.

Milkman, R. D. *see* Kennedy, D.

Miller, H. W. (1). Intestinal casts in *Pachyrhizodus*, an elopid fish, from the Niobrara formation of Kansas. *Trans. Kansas Acad. Sci.* 60 1957 : 400-402 2 figs.

Miller, H. W. (2). An elopid fish from the Codell sandstone (Cretaceous) of Kansas and the depositional environment of the sandstone. *Trans. Kansas Acad. Sci.* 61 : 213-215 1 pl.

Miller, H. W. & Mann, R. J. *Petalodus* (Bradyodont) from the Permian of Kansas of Oklahoma. *Trans. Kansas Acad. Sci.* 61 : 97-103 2 pls.

Miller, J. D. *see* Cole, B. J.

Miller, L. F. *see* Hulse, D. C.

Miller, R. B. The rôle of competition in the mortality of hatchery trout. *J. Fish. Res. Bd. Can.* **15** : 27-45 1 fig.

Miller, R. L. *see* Olson, E. C.

Miller, R. R. A Panamanian gobiid fish, *Microgobius miraflorensis*, from Western Mexico, with taxonomic and ecological notes. *Copeia* **1958** : 235-237.

Millot, J. & Anthony, J. (1). Anatomie de *Latimeria chalumnae*. Tome 1. Squelette, muscles et formations de soutien. Paris (Edit. Centre Nat. Rech. Sci.) ff. 122 82 pls. text-illustr.

Millot, J. & Anthony, J. (2). De l'existence chez *Latimeria chalumnae* Smith (Coelacanthidae) d'un organe régulateur du courant sanguin supra-branchiel. *C.R. Acad. Sci. Paris* **246** : 1600-1602 1 fig.

Milne, D. J. Recent British Columbia spring and coho salmon tagging experiments, and a comparison with those conducted from 1925 to 1930. *Bull. Fish. Res. Bd. Can.* No. 113 1957 : pp. vii, 56 : 13 figs.

Milochin, A. A. (1). Über eigene rezeptorische Neuronen des vegetativen Nervensystems. *Z. mikr. anat. Forsch.* **63** : 497-517 11 figs.

Milochin, A. A. (2). Über den sensiblen Nervenplexus des Verdauungstraktes. *Z. mikr. anat. Forsch.* **63** : 518-522 2 figs.

Milward, N. E. A cling fish new for W. Australia. *W. Aust. Nat.* **6** : 106.

Minamori, S. (1). Physiological isolation in Cobitidae IV. Speciation of two sympatric races of Lake Biwa of the striated spinous loach. *Jap. J. Zool.* **12** No. 1 1956 : 89-104 figs.

Minamori, S. (2). Physiological isolation in Cobitidae. V. Sterility of the hybrids between the mud loach and six races of spinous loaches. VI. Temperature adaptation and hybrid inviability. *J. Sci. Hiroshima Univ. (Zool.)* **17** 1957 : 55-64 1 pl. 2 figs. & 65-119 18 figs.

Minckley, W. L. A fish survey of the Pillsburg Crossing area, Deep Creek, Riley County, Kansas. *Trans. Kansas Acad. Sci.* **59** 1956 : 351-357.

Minckley, W. L. *see* Cross, F. B.

Miranda Ribeiro, P. de. Catálogo dos Peixes do Museu Nacional. II. Aspredinidae Gill, 1872. Electro-phoridae Gill, 1872. Doradidae Günther, 1864. *Publ. avuls. Mus. nac. Rio de J.* No. 22 : 1-10.

Mironesco, I. *see* Feider, Z.

(Mironova, N. V.). [The European Chimaera in Eastern Murman.] *Priroda* **6** : 116 2 fig. [In Russian.]

Mišík, V. (1). Forellenbarsch (*Micropterus salmoides* Lacépède 1802) in der Donau. *Biológia, Bratislava* **13** : 219-222 1 fig. [German summary.]

Mišík, V. (2). Zur Vorkommen und zur Biometrik der *Cobitis aurata* (Filippi 1865) *balcanica* Karaman 1922 *natio montana* (?) Vladykov 1925 z rieky Kysuse. *Biológia, Bratislava* **13** : 810-832 13 figs. [German summary.]

Mišík, V. (3). Die Biometrik des Donauwildkarpfens (*Cyprinus carpio carpio* L.) aus dem Donausystem der Slowakei. *Biol. práce, Bratislava* **4** No. 6 : 55-125 6 figs. [German summary.]

Misra, K. S. On the distribution of the elasmobranchs and chimaeras of the Indian region in relation to the mean annual isotherms. *Rec. Indian Mus.* **53** 1955 [1958] : 73-86 2 maps.

Mitani, F. (1). Feeding habits of the yellow tail, *Seriola quinqueradiata* T. & S., caught in Wakasa Bay, the Japan Sea, based on its stomach contents. *Bull. Jap. Soc. sci. Fish.* **24** : 176-185.

Mitani, F. (2). Studies on the maturity and spawning of the yellow tail, *Seriola quinqueradiata* T. & S. found in the Japanese waters and their adjacent regions. I. Bilateral asymmetry of gonad and maturity grade. II. Spawning season and spawning area. *Jap. J. Ecol.* **8** : 7-11 2 figs. & 53-62 2 figs.

Mito, S. Egg development and hatched larvae of *Girella punctata* Gray (Girellidae, Teleostei). *Jap. J. Ichthyol.* **6** 1957 : 105-108 1 fig. [English summary.]

Mito, S. *see* Dôtu, Y.

Mito, S. *see* Uchida, K.

Mitra, G. N. On the Hilsa of the Chilka Lake, with a note on the occurrence of Hilsa in Orissa. *J. Asiat. Soc. (Sci.)* 20 1954 : 33-40 3 figs.

Miura, I. *see* Sakano, E.

Miyadi, D. *see* Kawanabe, H.

Miyajima, T. *see* Nakamura, K.

Mizuno, N. *see* Kawanabe, H.

Moatti, J.-P. *see* Grangaud, R.

Modglin, F. R. *see* Halstead, B. W.

Moffett, A. W. *see* Randall, J. E.

Mohapatra, P. The 'Marala'—a sink net used in the backwaters on Ganjam, Orissa. *J. Bombay nat. Hist. Soc.* 54 1957 : 773-775 2 figs.

Mohmed, K. H. *see* Bal, D. V.

Mohr, E. Der Wels. Wittenberg-Lutherstadt (A. Ziemsen Verlag) 1957, pp. 42 39 figs.

Mohsen, T. (1). Étude morphologique des éléments du système suspensorial dans une souche particulière de *Lebistes reticulatus*. *Proc. Egypt. Acad. Sci.* 11 1956 : 67-73 3 figs.

Mohsen, T. (2). Étude chronologique des étapes de la différenciation des caractères sexuels secondaires externes et des éléments du suspensorium dans une souche particulière de *Lebistes*. *C.R. Soc. Biol., Paris* 151 : 1231-1234 figs.

Mohsen, T. (3). Masculinisation des gonades femelles chez *Lebistes reticulatus*, sous l'influence prononcée de la pregnéninone. *C.R. Soc. Biol., Paris* 151 : 1744-1747.

Mohsen, T. (4). Masculinizing action of pregnenindone on female gonads in the cyprinodont, *Lebistes reticulatus* R. *Nature, Lond.*, 181 : 1074.

Moitra, S. K. (1). Condition factor in some fishes of Lucknow, Uttar Pradesh. *Curr. Sci.* 25 1956 : 292-293 1 fig.

Moitra, S. K. (2). On the food habits of certain fishes in Lucknow. *Proc. Zool. Soc., Calcutta* 9 1956 : 89-91.

Moitra, S. K. *see* Das, S. N.

Molander, A. R. Some marginal notes on the question of the growth and size of plaice and flounder in the Southern Baltic. *Rep. Inst. Mar. Res. Lysekil* No. 4 1955 : 1-18.

Molander, A. R. & Molander-Swedmark, M. Experimental investigations on variation in plaice, *Pleuronectes platessa* Linné. *Rep. Inst. mar. Res. Lysekil. Ser. Biol.* No. 7 1957 : 1-44 1 pl. 14 figs.

Monteiro, R. (1). Study on the biology of the Triglidae family. II. *Trigla lineata* Gmelin of the region of Banyuls. *Proc. Fish. Counc. Mediterr. F.A.O.* 4 1957 : 37-42.

Monteiro, R. (2). Heterosomata de Angola. I. Contribução para o estudo das famílias Psettodidae, Citharidae, Paralichthyidae e Bothidae. *An. Jta Invest. Ultramar, Lisbon* 12 Tom. 2 : 87-130 26 figs.

Monteiro, R. (3). Heterosomata of Angola. I. Contribution on the study of the familiar Psettodidae, Citharidae, Paralichthyidae and Bothidae. *Conf. int. Afr. occid. Sess.* 6 4 : 207-212.

Mookerjee, H. K. & others. Structure and development of the Weberian ossicles in *Heteropneustes fossilis*. *Anat. Anz.* 101 1954 : 133-146 2 pls. 2 figs.

Moore, G. A. Fishes. In Blair, W. F. & others. *Vertebrates of the United States*, New York (McGraw Hill) 1957 pp. 31-210 111 figs.

Moore, H. B. *Marine Ecology*, New York, i-xi, 1-493 figs.

Moore, R. B. *see* Hoese, H. D.

Moorman, R. B. Reproduction and growth of fishes in Marion County, Iowa. *Iowa St. Coll J. Sci.* 32 1957 : 71-88.

Moreau, R. *see* Jullien, A.

Moretti, G. & others. Indagini elettroforetiche su proteine muscolari di alcune specie di pesci viventi nel L. Trasimeno. *Riv. Biol. Perugia* 50 : 205-214 1 fig. [Italian with English summary.]

Morgan, G. D. A study of six different pond stocking ratios of large-mouth bass, *Micropterus salmoides* (Lacépède), and bluegill, *Lepomis microchirus* Rafinesque; and the relation of the chemical, physical and biological data and pond balance and productivity. *J. sci. Labs Denison Univ.* 44 : 151-202 3 figs.

Mori, K. *see* Okada, Y.

- Mori, S. *see* Kawanabe, H.
- Morice, J. Animaux marins comestibles des Antilles françaises. Rev. Trav. Inst. Pêches marit. **22** : 85-104.
- Morimoto, Y. *see* Hoshina, T.
- Moriyana, S. *see* Kobayasi, H.
- Morris, R. The mechanism of marine osmoregulation in the lampern (*Lam-petra fluviatilis* L.) and the causes of its breakdown during the spawning migration. J. exp. Biol. **35** : 649-665 2 figs.
- Morrow, J. E. (1). Shore and pelagic fishes from Peru, with new records and the description of a new species of *Sphoeroides*. Bull. Bingham oceanogr. Coll. **16** No. 2 1957 : 5-55 12 figs.
- Morrow, J. E. (2). Mid-depth fishes of the Yale South American Expedition. Bull. Bingham oceanogr. Coll. **16** No. 2 1957 : 56-71 2 figs.
- Morrow, J. E. (3). Races of the striped Marlin *Makaira mitsukurii* in the Pacific. Bull. Bingham oceanogr. Coll. **16** No. 2 1957 : 72-87 4 figs.
- Morrow, J. E. (4). On the morphology of the pectoral girdle in the genus *Makaira*. Bull. Bingham oceanogr. Coll. **16** No. 2 1957 : 88-105 4 figs.
- Mosher, K. H. Age determination of Pacific sardine from otoliths. Res. Rep. U.S. Fish. Serv. No. 37 1954 : 1-40 2 figs.
- Motwani, M. P. & Bose, B. B. Oxygen requirements of fry of the Indian Major carp, *Labeo rohita* (Hamilton). Proc. nat. Inst. Sci. India **23B** 1957 : 8-16.
- Motwani, M. P. & David, A. Fishes of the River Sone with observations on the zoogeographical significance. J. zool. Soc. India **9** 1957 : 9-15.
- Motwani, M. P. & Karamchandani, S. J. A note on the food and feeding habits of *Clupisoma garua* (Hamilton) and *Eutropiichthys vacha* (Hamilton) from Allahabad. Curr. Sci. **27** : 55-56.
- Motwani, M. P. & others. On the breeding of the Indian Shad, *Hilsa ilisha* (Hamilton) in fresh waters. Sci. & Cult. **23** 1957 : 47-48.
- Moulton, J. M. (1). Influencing the calling of sea robins (*Prionotus* spp.) with sound. Biol. Bull. Woods Hole **111** 1956 : 393-398.
- Moulton, J. M. (2). The acoustical behaviour of some fishes in the Bimini area. Biol. Bull. Woods Hole **114** : 357-374 16 figs.
- Moulton, J. M. (3). A summer silence of sea robins, *Prionotus* spp. Copeia **1958** : 234-235.
- Mouriquand, G., Edel, V. & Chig-hizola, R. Chocs V chronaxiques et physiques, et frontières léthales chez le Cyprin passant de l'eau douce dans l'eau salée. C.R. Acad. Sci. Paris **247** : 732-735.
- Moussa, T. A. Physiology of the accessory respiratory organs of the teleost, *Clarias lazera* (C. & V.). J. exp. Zool. **136** 1957 : 419-454 11 figs.
- Mousset, G. Sur la maturation sexuelle du congre. Bull. Centre Ét. Rech. sci. Biarritz **1** 1957 : 559-561.
- (Movchan, V. A.) (1). [Fish-farming]. Priroda **8** 1957 : 45-50 6 figs. [In Russian.]
- (Movchan, V. A.) (2). [Fish farming in Sov.-Khoz.]. Priroda **10** 1957 : 107-108. [In Russian.]
- (Movchan, V. A.) (3). [On the increasing of fish productivity in ponds.] Visnik Akad. Nauk **7** : 61-67. [In Ukrainian.]
- Mowbray, L. L. *see* Osburn, R. C.
- Müller, G. Consideratii asupra anomaliiilor scheletice ale crapului de cultura de la Zaul-de-Cimpie. Bul. Inst. Cercet. Pisc. Roman. **16** (3) 1957 : 83-90.
- Müller, G. J. *Scardinius racovitzai* n. sp. (Pisces, Cyprinidae), eine reliktäre Rotfeder aus Westrumänien. Senck. biol. **39** : 165-168 3 figs.
- Müller, W. Das Wachstum der Quappe (*Lota lota* L.) im Oderhaff und in deutschen Gewässern. Verh. int. Ver. Limnol. **13** : 743-747 1 fig.
- Muncy, R. J. Movements of channel catfish in Des Moines River, Boone County, Iowa. Iowa St. Coll. J. Sci. **32** : 563-571 3 figs.
- Münnich, H. Zusammenhänge zwischen dem Sauerstoffgehalt des Wassers und dem Blutzuckerspiegel des Karpfens, (*Cyprinus carpio* L.). Z. Fisch. **7** : 447-458 4 figs.

Munro, I. S. R. (1). Handbook of Australian fishes. Fish. Newsl. **16** Nos. 15-18 1957 : 61-76 figs.; **17** Nos. 10, 19-30 : 77-124 figs.

Munro, I. S. R. (2). The fishes of the New Guinea region. A check-list of the fishes of New Guinea incorporating records of species collected by the Fisheries Survey Vessel "Fairwind" during the years 1948 to 1950. Fish. Bull. Papua No. 1 : 97-369 1 fig.

Munro, W. R. The pike of Loch Choin. Sci. Invest. Freshwat. Fish. Edinb. **16** 1957 : 1-16 4 figs.

Munteanu, I. Observations sur le rythme de croissance et la nourriture de *Vimba vimba natio carinata* (Pallas) du complexe Razelm. Bul. Inst. Cercet. Pisc. Roman. **16** No. 4 1957 : 55-59.

Munteanu, I. *see* Leonte, V.

Munz, F. W. (1). Photosensitive pigments from retinae of deep-sea fishes. Science **125** 1957 : 1142-1143.

Munz, F. W. (2). Photosensitive pigments from the retinae of certain deep-sea fishes. J. Physiol. **140** : 220-235 5 figs.

Munz, F. W. (3). Retinal pigments of a labrid fish. Nature, Lond. **181** : 1012-1013 2 figs.

Munz, F. W. *see* McFarland, W. N.

Murakawa, G. *see* Hatanaka, M.

Murakawa, S. *see* Honma, Y.

Murray, A. R. (1). Preliminary biology of Atlantic salmon of the Little Codroy River, Newfoundland. Progr. Rep. Atl. biol. Sta. No. 68 : 20-27.

Murray, A. R. (2). A direct-current electrofishing apparatus using separate excitation. Stud. Fish. Res. Bd. Can. **1958** No. 541. [Reprinted from Can. Fish. Culturist No. 23 : 1-6.]

Mužinić, R. (1). A contribution to the investigation of relations of Sardine (*Sardina pilchardus* Walb.) to the environment. Acta adriat. **8** No. 10 : 1-19 2 figs. [English summary.]

Mužinić, R. (2). Preliminary observations on Sardine (*Sardina pilchardus* Walb.) from the West coast of Istra. Acta adriat. **8** No. 11 : 1-7 3 figs. [English summary.]

Mužinić, R. & Richardson, I. D. On the appearance of rings on herring scales. J. Cons. int. Explor. Mer **24** : 120-134 6 figs.

Mužinić, R. *see* Bougis, P.

Myers, G. S. (1). Trends in the evolution of teleostean fishes. Stanf. ichthyol. Bull. **7** : 27-30.

Myers, G. S. (2). Nomenclator of certain terms used for higher categories of fishes. Stanf. ichthyol. Bull. **7** : 31-42.

Nadamitsu, S. Effects of potassium fluoride on the *in vitro* ovulation in the spinous loach. Zool. Mag., Tokyo **67** : 152-154. [In Japanese, English summary.]

Nagar, S. K. & Khan, W. M. The anatomy and histology of the alimentary canal of *Mastacembelus armatus* (Lacep.). Proc. Indian Acad. Sci. **47B** : 173-187 3 pls. 3 figs.

Nagasaki, F. The fecundity of Pacific herring (*Clupea pallasii*) in British Columbia coastal waters. J. Fish. Res. Bd. Can. **15** : 313-330 4 figs.

Nagasawa, A. *see* Sano, S.

Naguib, M. On the structure of the pancreas of *Tilapia nilotica* Boul. Zool. Anz. **161** : 47-54 5 figs.

Nair, G. S. (1). On the breeding habits and development of *Ambassis gymnocephalus* (Lac.). Bull. centr. res. Inst. Univ. Travancore **5C** 1 1957 : 69-76 2 figs.

Nair, G. S. (2). Notes on the early development of *Mugil cephalus* Linnaeus. Bull. centr. res. Inst. Univ. Travancore **5C** 1 1957 : 77-84 1 fig.

Nakagome, J. (1). Morphometric comparison of yellowfin tuna for the western, middle and eastern parts of the Indian Ocean. Bull. Jap. Soc. sci. Fish. **24** : 165-168.

Nakagome, J. (2). On the seasonal variation of swimming layers of yellowfin tuna, big eyed tuna, and black marlin in the area of Caroline and Marshall Island. Bull. Jap. Soc. sci. Fish. **24** : 169-175.

Nakagome, J. (3). On the periodical change of the fishing condition and the body-length of a whole year and the distribution and migration of swordfish of the northwestern part of the

Pacific Ocean. Bull. jap. Soc. sci. Fish. **24** : 322-325 9 figs. [Japanese with English summary.]

Nakahara, K. *see* Uchida, K.

Nakamura, K. and others (1). Fish production in seven farm ponds in Shioda Plain, Nagano Prefecture with reference to natural limnological environment and artificial treatment. Bull. Freshw. Fish. Res. Lab. Tokyo **3** No. 1 1954 : 27-80 1 pl.

Nakamura, K. & others (2). Possibility of carp fingerling production in farm-pond, Nagano Prefecture. Bull. Freshw. Fish. Res. Lab. Tokyo **6** No. 2 1956 : 1-49 1 pl. [English summary.]

Nakamura, K. & others (3). An experiment of raising carp fingerling in farm pond, study in Gorobeioike. Bull. Freshw. Fish. Res. Lab. Tokyo **7** (2) : 19-44.

Nakamura, M. & Kawai, Y. (1). A list of the fresh-water fishes of Shimokita Peninsula (Preliminary report). Misc. Rep. res. Inst. nat. Resourc. Nos. 46-47 : 101-103. [English summary.]

Nakamura, M. & Kawai, Y. (2). A land-locked form of *Oncorhynchus masou* (Brevoort) in Ohata River, Homori Prefecture. Misc. Rep. res. Inst. nat. Resourc. Nos. 46-47 : 103-107 2 pls. [English summary.]

Nakamura, M. *see* Inaba, D.

Nalbandoglu, U. Contents of the stomachs of mackerel (*Scomber scomber* L.) caught in the Marmara, the Bosphorus and in the areas of the Black Sea bordering the Bosphorus. Proc. Fish Coun. Mediterr. F.A.O. **4** 1957 : 181-192.

Nall, G. H. Movements of salmon and sea trout chiefly kelts, and of brown trout tagged in the Tweed between January and May, 1937 and 1938. Sci. Invest. Freshwat. Fish., Edinb. **10** 1955 : 1-19.

Narain, D. Studies in the gametogenesis of fishes. Infiltration of the cytoplasmic organelles from the follicle cells into the oocytes. Trans. Amer. micr. Soc. **75** 1 1956 : 79-84 1 pl.

Narayana Rao, K. V. & Pampapathi Rao, K. Differences in the food of the young and the adult Indian mackerel, *Rastrelliger kanagurta* (Cuv.) Nature, Lond. **180** 1957 : 711-712 1 fig.

Nardone, R. M. Some aspects of the ecology and tissue chemistry of the Arctic blackfish, *Dallia pectoralis*. Washington D.C. (Office of Naval Research) 1956 ff. 29.

Nath, V. Animal gametes (Part I-V). Res. Bull. Panjab Univ. No. 95-99 1957 : 1-207 112 figs.

Nawar, G. (1). On the anatomy of *Clarias lazera*. J. Morph. **97** 1955 : 23-38 5 figs.

Nawar, G. (2). On the anatomy of *Clarias lazera*. III. The vascular system. J. Morph. **97** 1955 : 179-214 11 figs.

Nawar, G. (3). Preliminary investigations on breeding times of some Nile fishes. Rep. hydrobiol. res. Unit Univ. Khartoum **1956-57** [1957] : 247.

Nawar, G. (4). Investigation of the breeding season of species of Nile fishes. Rep. hydrobiol. res. Unit. Univ. Khartoum No. 5 : 20-21.

Necrăsov, O. & others (1). Contribution à l'étude de la structure microscopique du sac vasculaire des poissons osseux. An. Sti. Univ. "A. I. Cuza" Iasi N.S. (2) **2** 2 1956 : 73-117 52 figs. [French summary.]

Necrăsov, O. & others (2). Contribution à l'étude de la croissance et du développement de la carpe (*Cyprinus carpio* L.) en captivité (dans les aquariums) et dans son milieu naturel. Note 1. An. Sti. Univ. Iasi N.S. (2) **3** 1-2 1957 : 121-130 3 pls.

Necrăsov, O. & others (3). Contribution à l'étude de la croissance et du développement de la carpe (*Cyprinus carpio* L.) en captivité (dans les aquariums), en comparaison de sa croissance et de son développement en milieu naturel. II. An. Sti. Univ. "A. V. Cuza" Iasi Sti. nat. N.S. (2) **4** 1 : 67-76. [French summary.]

Nedelec, C. Biologie et pêche du maquereau. Rev. Trav. Inst. Pêches marit. **22** : 121-134 5 figs.

Nelson, P. R. Relationship between rate of photosynthesis and growth of juvenile red salmon. Science **128** : 205-206 1 fig.

Nelson, P. R. & Abegglen, C. E. Survival and spawning of gill net marked red salmon. Res. Rep. U.S. Fish Serv. No. 40 1955 : 1-19 10 figs.

Newell, B. S. *see* Garrod, D. J.

Newman, H. W. (née Elkin). Salmon of the River Lee, 1944 and 1945. Proc. R. Irish Acad. 59B : 53-69.

Newman, K. *see* Irvine, D. G.

Newnham, C. T. *see* Tucker, D. W.

Newstead, J. D. *see* Ford, P.

Nicholls, A. G. (1). The Tasmanian trout-fishery. I. Survey of information and treatment of data. Aust. J. mar. freshw. Res. 8 1957 : 451-475 1 pl. 5 figs.

Nicholls, A. G. (2). The Tasmanian trout fishery. II & III. Aust. J. mar. freshw. Res. 9 : 19-59 1 pl. 11 figs.; & 167-190 9 figs.

Nicholls, A. G. (3). The population of a trout stream and the survival of released fish. Aust. J. mar. freshw. Res. 9 : 319-350 4 figs.

Nicholls, A. G. (4). The egg yield from brown and rainbow trout in Tasmania. Aust. J. mar. freshw. Res. 9 : 526-536 5 figs.

Nichols, J. T. A new Goby and other fishes from Formosa. Amer. Mus. Novit. No. 1876 : 1-7 1 fig.

Nicol, J. A. C. Observations on luminescence in pelagic animals. J. mar. biol. Ass. U.K. 37 : 705-752 1 pl. 19 figs.

Nicolau, S. S. & others. Étude clinique de la neurovirose hydropigène des poissons. Stud. Circet. Inframicrobiol. Acad. Republ. rom. 2 1951 : 53-93 31 figs. [French summary.]

Nie, D. & Chiang, S.-c. Notes on the food habits of cyprinoid fishes—*Aristichthys nobilis* and *Hypophthalmichthys molitrix*. Acta. zool. Sinica 6 1954 : 59-71 16 figs. [In Chinese.]

Nielsen, J. *see* Bruun, A. F.

Nieuwenhuizen, A. van den (1). Merkwürdiges Benehmen von *Aphyosemion bivittatum*. Aquar. Terrar. Z. 11 : 8-11 8 figs.

Nieuwenhuizen, A. van den (2). *Pachypanchax homalonotus* (Dumeril). Aquar. Terrar. Z. 11 : 73-76 4 figs.

Nieuwenhuizen, A. van den (3). *Ctenopoma fasciolatum* (Boulenger). Aquar. Terrar. Z., 11 : 163-167 11 figs.

Nieuwenhuizen, A. van den (4). *Badis badis* (Hamilton). Aquar. Terrar. Z. 11 : 359-362 7 photos.

Nigrelli, R. F. *see* Vishniac, H. S.

Niiyama, H. Effects of X-irradiation upon rainbow trout (*Salmo irideus*) II. Stimulative effects of X-rays on spermatogenesis in fry. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 281-288 6 figs.

Nikolsky, G. (1). The loaches of inland waters of Turcomania. Bull. Soc. nat. Moscou. Sect. Biol. N.S. 52 No. 3 1947 : 29-34 4 figs. [Russian with English summary.]

Nikolsky, G. (2). Notes on recent Atlantic salmon investigations in the U.S.S.R. J. Cons. int. Explor. Mer 23 : 434-439.

(Nikolski, G. V. & Pikuleva, V. A.). [On the adaptive value of variability amplitude of individual characters and properties of organisms.] Zool. Zh. 37 : 972-988 2 figs. [In Russian with English summary.]

(Nikolski, G. V. & Tzentilovich, F. F.). [The fishes of Murgab river basin (Turkmenia).] Arch. Mus. zool. Univ. Moscou. 7 1951 : 105-112. [In Russian.]

(Nikolyukin, N. I.). [Hybridization in fishes.] Priroda 2 : 31-38 6 figs. [In Russian.]

Nilsson, N.-A. On the food competition between two species of *Coregonus* in a North-Swedish lake. Rep. Inst. Freshw. Res. Drottningh. 39 : 146-161 5 figs.

Nishida, H. (1). On the structure of the periblast of *Oncorhynchus keta* (Walbaum). Sci. Rep. Hokkaido Salmon Hatchery No. 12 : 31-36 figs. 1-8. [Japanese with English summary.]

Nishida, H. (2). The periblast nucleus in the dog-salmon embryo, *Oncorhynchus keta*. Sci. Rep. Hokkaido Salmon Hatchery No. 12 March 1958 : 37-44 figs. 1-12. [Japanese with English summary.]

Nishimura, N. *see* Kawanabe, H.

Nishino, K. Chum salmon tagging experiments in spawning streams of Hokkaido. Sci. Rep. Hokkaido Salmon Hatchery No. 12 : 51-61. [Japanese with English summary.]

Nogusa, S. (1). Chromosome studies in Pisces, VI. The X-Y chromosomes found in *Cottus pollux* Günther (Cottidae). J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 289-292 13 figs.

Nogusa, S. (2). Chromosome studies in pisces. VII. A comparative study of the chromosomes in six species of the Gobiidae. Jap. J. Ichth. 6 1957 : 141-146.

Nomura, M. see Inaba, D.

Norris, K. S. see Davenport, D.

Norris, K. S. see McFarland, W. N.

Northcote, T. G. Effect of photoperiodism on response of juvenile trout to water currents. Nature, Lond. 181 : 1283-1284 1 fig.

Norvell, J. see Schwartz, F. J.

(Nosal, A. D.). [Presence of *Coregonus peled* in Dnieper.] Priroda 8 1957 : 104. [In Russian.]

(Novikov, N. P.). [Freshwater ichthyofauna of certain littoral isles of the Sea of Japan.] Zool. Zh. 37 : 461-465. [In Russian with English summary.]

Nüesch, H. Augenentwicklung und Schlüpftermin bei Hecht und Forelle. Rev. suisse Zool. 65 : 396-404 4 figs.

Nümann, W. Results of marking experiments on short finned tunas and mackerels in Turkish waters. Proc. Fish. Coun. Mediterr. F.A.O. 4 1957 : 69-74.

Nursall, J. R. (1). A method of analysis of the swimming of fish. Copeia 1958 : 136-141 6 figs.

Nursall, J. R. (2). The caudal fin as a hydrofoil. Evolution 12 : 116-120.

Nybelin, O. (1). Les canaux sensoriels du museau chez *Elops saurus* (L.). Notice préliminaire. Ark. Zool. (2) 10 1957 : 453-458 3 figs.

Nybelin, O. (2). Über die angebliche Viviparität bei *Thrissops formosus* Agassiz. Ark. Zool. 11 : 447-455 10 figs.

Nybelin, O. (3). Ett bidrag till vara sotvattenssimpors taxonomi. Zool. Revy 20 : 3-10 12 figs. [English summary.]

Nybelin, O. & Poll, M. Brotulidae des côtes africaines de l'Atlantique sud avec description d'une espèce nouvelle de *Lamproprogrammus*. Bull. Inst. Sci. nat. Belg. 34 No. 19 : 1-7 1 fig.

Obruchev, D. V. (1). Body-fins and mode of life of earliest Vertebrates. Proc. 15th Int. Congr. Zool. : 434-435 (Sect. 5 paper 10 2 pp. 2 figs.)

Obruchev, D. V. (2). [On the biostratigraphy of the Lower and Middle Palaeozoic ichthyofauna of the U.S.S.R.] Sovet-Geol. 1958, 11 pp. 40-53. [In Russian, English Summary p. 52.]

Ochiai, A. (1). On the growth pattern of the soleoid fishes taken mainly from southern part of Japan. Bull. Jap. Soc. Sci. Fish. 22 1956 : 279-283 4 figs. [English summary.]

Ochiai, A. (2). A preliminary report on the fin organ of a soleoid fish, *Pardachirus pavoninus* (Lacépède). Mem. Coll. Agric. Kyoto Univ. No. 76 (Fish. Ser. No. 7) 1957 : 29-32 1 pl. 2 figs.

Oehlert, B. Kampf und Paarbildung einiger Cichliden. Z. Tierpsychol. 15 : 141-174 6 figs.

Ogawa, M. (1). On the agglomerular fishes in Japan and their kidney structures. Zool. Mag., Tokyo 66 1957 : 420-424 2 figs.

Ogawa, M. (2). Further study on the agglomerular fishes in Japan. Zool. Mag., Tokyo 67 : 329-333. [English summary.]

Ogilvie, J. M. G. & Warren, A. A. The occurrence of trimethylamine oxide in *Fundulus heteroclitus*. Canad. J. Zool. 35 1957 : 735-745 3 figs.

Ogino, C. Amino acid composition of the protein of hatchery diet. Bull. Jap. Soc. sci. Fish., 23 1957 : 447-449. [Japanese with English summary.]

Ogino, C. see Suyama, M.

Ogura, M. see Inoue, M.

Oguro, C. (1). Notes on the change in the kidney of *Gasterosteus aculeatus aculeatus* (L.) caused by the estrogen administration. J. Fac. Sci. Hokkaido Univ. (Ser. vi) 13 1957 : 404-407 2 figs.

Oguro, C. (2). Effects of sex hormones on the kidneys of the three-spined stickleback, *Gasterosteus aculeatus aculeatus*. J. Fac. Sci. Hokkaido Univ., Ser. VI 14 : 45-50 8 figs.

Ohgushi, R. *see* Kawanabe, H.

Ohtsuka, E. Carbohydrate component of the perivitelline fluid and its origin in the egg of *Oryzias latipes*. Zool. Mag., Tokyo 67 : 96-99 2 figs. [Japanese with English summary.]

Ojima, Y. The desoxyribose nucleic acid (DNA) content in liver cells of the carp-funa hybrids. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 293-296 2 figs.

Okada, I. *see* Kikuchi, T.

Okada, K. *see* Ishiyama, R.

Okada, Y. Geographical distribution of bottom fishes in Japan. Rep. Fac. Fish. Univ. Mie 2 (3) 1957 : 448-450.

Okada, Y. & Kubota, S. S. (1). A new Cyprinoid fish, *Pseudorasbora parva uchidai*, sub-sp. nov. found in Japan. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 99-100 1 fig.

Okada, Y. & Kubota, S. S. (2). Studies on the fish fauna at the southern vicinity of Tsu City, Mie Prefecture. Supplemental note—I. Rep. Fac. Fish. Univ. Mie 2 : 451-452.

Okada, Y. & Mori, K. (1). Descriptions and figures of marine fishes obtained at Mie Prefecture, the middle of Honshu, Japan. J. Fac. Fish. Univ. Mie 3 : 1-39 36 figs.

Okada, Y. & Mori, K. (2). Note on rare lantern-fish, *Diaphus sagamiensis* Gilbert from Kumano-nada, Japan. Rep. Fac. Fish. Univ. Mie 2 : 453-455 2 figs.

Okada, Y. & Mori, K. (3). Ecological study of *Salangichthys microdon* in breeding season. II. Development of the "white fish," *Salangichthys microdon*. Rep. Fac. Fish. Univ. Mie 3 : 26-28 2 pls.

Okada, Y. & Suzuki, K. (1). On the similarity of the osteological characters found between Owstoniidae and Cepolidae. Rep. Fac. Fish. Univ. Mie 2 1956 : 185-194 3 figs.

Okada, Y. & Suzuki, K. (2). Notes on the young of rare fish. *Taractes steindachneri* (Döderlein). Rep. Fac. Fish. Univ. Mie 2 1956 : 195-198 1 fig.

Okada, Y. & Suzuki, K. (3). Ecological studies of the Ma-anago, *Astroconger myriaster* (Brevoort). II. Notes on the circuli of the otolith of the Ma-anago in Ise Bay. Rep. Fac. Fish. Univ. Mie 3 : 17-25 4 figs.

Okafuji, G. *see* Shikama, T.

Okaichi, T. & others. A rapid color change in the filefish. Bull. jap. Soc. sci. Fish. 24 : 389-393. 1 pl. 1 fig. [Japanese with English summary.]

Okubo, H. *see* Nakamura, K.

Okuno, R. & others. A study of the productivity of the Tanabe Bay (Part 1). V. Distribution and abundance of rocky reef fishes in the Tanabe Bay. Rec. oceanogr. Wks. Japan. Spec. no. 2 : 36-42 2 figs.

Okutani, T. *see* Hattori, S.

Oliiva, O. (1). Some results with fish marking. Acta Univ. Carol. Praha, Biol. 5 : 33-48 pls. i-iv.

Oliiva, O. (2). A note on *Pseudoscaphirhynchus kaufmanni* (Bogdanow) (Osteichthys, Acipenseridae). Mém. Soc. zool. tchécosl. 22 : 6-9 2 pls.

Oliiva, O. (3). On the sea lamprey (*Petromyzon marinus* L.) from the River Elbe near of Děčín. Mém. Soc. zool. tchécosl. 22 : 111-112 2 pls. [English summary.]

Oliiva, O. & Opatrný, E. [Note to the genus *Polypterus* E. Geoffroy St. Hilaire with regard to specimens kept in our collections]. Čas. nar. Mus. Praha 127 : 191-204 5 figs. [English summary.]

Oliveira, J. J. de & Pinto, J. dos S. Evolution of the average weight of the pilchard (*Sardina pilchardus* Walb.) on the Portugal coasts in the years 1952-1956. Rev. Fac. Ciênc., Lisbon (2C) 6 : 5-14 3 figs.

Oliver, M. Biology of the sardine of the Balearic Islands. (Spawning, hatching and growth during the first year). Proc. Fish. Council. Mediterr. F.A.O. 4 1957 : 51-62.

Olivereau, M. Étude anatomique et histologique de la glande thyroïde du thon (*Thunnus thynnus* L. et *Germo alalunga*). Bull. Soc. zool. Fr. 82 : 401-417 21 figs.

Olsen, A. M. New fish records and notes on some uncommon Tasmanian species. Pap. roy. Soc. Tasm. **92** : 155-159.

Olson, E. C. & Miller, R. L. Morphological integration pp. xv, 317 : 77 figs. Chicago.

Olsson, R. (1). The subcomissural organ. Stockholm (I. Haeggström) : pp. 16.

Olsson, R. (2). Studies on the sub-commissural organ. Acta zool., Stockh. **39** : 71-102 10 figs.

Olsson, R. (3). A bucco-hypophysial canal in *Elops saurus*. Nature, Lond. **182** : 1745 1 fig.

Oniceanu, E. see Necrasov, O.

Ono, Y. & Uematsu, T. Mating ethogram in *Oryzias latipes*. J. Fac. Sci. Hokkaido Univ. (Zool.) **13** 1957 : 197-202 1 fig.

Onodera, K. On the survival of trout fingerlings stocked in a mountain brook. I. The estimation of survival rate by observation. Bull. jap. Soc. sci. Fish. **24** : 428-434. [Japanese with English summary.]

Ookubo, M. see Hoshina, T.

Opatrný, E. Príspevek k systematice cejníka malého—*Blicca bjoerkna* (Linnaeus). [Beitrag zur Systematik des Gusters—*Blicca bjoerkna* (L.).] Čas. nar. Mus. Praha **127** : 139-148 3 text-figs. [German summary.]

Opatrný, E. see Oliva, O.

Oppenheimer, C. H. A bacterium causing tail rot in the Norwegian cod-fish. Publ. Inst. mar. Sci. Univ. Tex. **5** : 160-162 1 fig.

Oppenheimer, J. M. (1). The differentiation of derivatives of the lower germ layers in *Fundulus* following the implantation of shield grafts. J. exp. Zool. **128** 1955 : 525-559 12 figs.

Oppenheimer, J. M. (2). Regional differentiation of the brain in embryos of *Fundulus heteroclitus*. J. exp. Zool. **129** 1955 : 649-686 11 figs.

Oppenheimer, J. M. & Vassady, N. Abnormal brain size and functional regulation in *Fundulus*. Proc. nat. Acad. Sci. Wash. **42** 1956 : 785-787 1 fig.

Orange, C. J. & others. Schooling habits of yellowfin tuna (*Neothunnus macropterus*) and skipjack (*Katsuwonus pelamis*) in the Eastern Pacific Ocean, as indicated by purse seine catch records, 1946-1955. Bull. Inter-Amer. Tuna Comm. **2** 1957 : 83-113.

O'Rourke, F. J. & Makings, P. An inexpensive easily constructed fish-marking tag. Nature, Lond. **181** : 577 1 fig.

Ørvig, T. (1). Tänderna ock tand vävnaderna genom tiderna I, II. Zool. Revy, Stockh. **20** : 30-62 text figs. 1-11. [English Summary pp. 61-62.]

Ørvig, T. (2). *Pycnaspis splendens*, new genus, new species, a new ostracoderm from the Upper Ordovician of North America. Proc. U.S. Nat. Mus., Washington, **103** no. 3391 pp. 23 3 pls. 5 text-figs.

Osburn, R. C. & Mowbray, L. L. A new serranid fish from Florida, *Dermatolepis marmoratus*. N.Y. Zool. Soc. 1915 : 1-4 1 fig. [Omitted from previous volumes.]

Oskar, S. F. Faunistic-ecological investigations of the upper reaches of the River Bosna. Acta Ichthyol. Bosniae **3** 1956 : 29-61.

Ostermüller, W. (1). Einige Beobachtungen über *Tetraodon somphongsi*. Aquar. Terrar. Z. **10** 1957 : 288-290.

Ostermüller, W. (2). *Roeboidea guatemalensis* Günther. Aquar. Terrar. Z. **11** : 206-208 1 fig.

Östlund, E. see Johnels, A. G.

Östvedt, O. J. see Bückmann, A.

Otis, L. S. and others. Conditioned inhibition of respiration and heart rate in the gold fish. Science **126** 1957 : 263-264.

Otterbech, F. Undersøkelser over torsken i Oslofjorden. Fiskeridir. Skr. Havundersøk. **11** No. 2, 1954 : 1-17 7 figs.

Outram, D. N. see Taylor, F. H. C.

Outten, L. M. A study of the life history of the cyprinid fish *Notropis coccogenis*. J. Elisha Mitchell sci. Soc. **73** 1957 : 68-84.

Overbeeke, A. P. van. A preliminary note on the effect of Amphenoric "B" in *Betta splendens* Regan. Proc. Ned. Akad. wetens. **61C** : 78-88 1 pl. 1 fig.

Ozaki, H. Stratigraphical and paleontological studies on the Neogene and Pleistocene formations of the Tyôsi district. Bull. nat. Sci. Mus. Tokyo 4 : 1-182 24 pls. figs.

Padmanabhan, K. G. Early stages in the development of the toad fish, *Anntenarius marmoratus* Bleeker. Bull. centr. res. Inst. Univ. Travancore 5C 1 1957 : 85-92 1 pl.

Paiva, M. U'. Sôbre o contrôle da Pirambibu, *Serrasalmus rhombeus* (L., 1766) Lacépède, 1803, no açude Lima Campos (Ico, Ceará), atravei da pesca seletiva. Rev. bras. Biol. 18 : 251-266 4 figs. [English summary.]

Palayer, P. Fixation de phosphore radioactif dans différentes parties du cerveau, notamment dans l'épiphyse, et dans quelques tissus chez la Truite arc-en-ciel (*Salmo gairdnerii* Rich.). C.R. Soc. Biol. Paris 152 : 305-308.

(Palemichko, Z. G.). [The fundamental principles for development of the White Sea fish fauna.] Vop. Ikhtiol. 9 1957 : 19-28. [In Russian.]

Palmer, G. Some observations on the fauna of the Maldives Islands. Pt. V. Fishes. J. Bombay nat. Hist. Soc. 55 : 486-489 1 pl.

Palmer, G. & Wheeler, A. C. Teratological example of an electric ray, *Torpedo nobiliana* Bonaparte. Proc. zool. Soc. Lond. 130 : 449-454 1 pl.

P'an, K. see Liu, T. S.

Paloumpis, A. A. (1). Responses of some minnows to flood and drought conditions in an intermittent stream. Iowa St. Coll. J. Sci. 32 : 547-561 3 figs.

Paloumpis, A. A. (2). Measurement of some factors affecting the catch in a minnow seine. Proc. Iowa Acad. Sci. 65 : 580-586 1 fig.

Paloumpis, A. A. (3). The effects of drought conditions on the fish and bottom organisms of two small Oxbow ponds. Trans. Ill. Acad. Sci. 50 : 60-64.

Pampapathi Rao, K. Salinity tolerance of *Etroplus maculatus* (Bloch). Curr. Sci. 27 : 99.

Pampapathi Rao, K. see Narayana Rao, K. V.

Panos, T. C. see Russell, F. E.

Pantulu, V. R. Studies on the biology of the Indian freshwater eel, *Anguilla bengalensis* Gray. Proc. nat. Inst. Sci. India 22B 1957 : 259-280 1 pl. 10 figs.

Pao, S. see Ping, C.

Papadopol, M. (1). Étude de l'âge et de la croissance de la carpe du Lac Greaca. An. Univ. "C. J. Parhon" București: Ser. St. nat. 14 1957 : 171-178. [French summary.]

Papadopol, M. (2). Contributions à l'étude comparatif de la croissance de la Brème commune (*Brama brama* L.) dans la delta de Danube et dans les lacs Brăila et Călărași. An. Univ. "C. J. Parhon" București. Ser. St. Nat. 16 1957 : 131-139. [French & Russian summaries.]

Paraiso, E. Noms vernaculaires de quelques animaux marins récoltés en Casamance. Notes afr. No. 80 : 124-125.

Paraketsov, I. A. On the protective role of spines and thorns in fishes. J. gen. Biol. 19 : 449-456 2 figs. [Russian with English summaries.]

Parenzan, P. (1). Un reperto interessante nel mare di Taranto- prima cattura di *Chlopsis bicolor* Raf. (Pisces). Boll. Pesca Piscic. Idrobiol. 32 1956 297-299.

Parenzan, P. (2). Un caso di "teratocenosi" ittica nel Mar Piccolo di Taranto. Thalassia Jonica 1 : 73-87 2 pls.

Parker, P. S. & Lennon, R. E. Biology of the sea lamprey in its parasitic stage. Res. Rep. U.S. Fish. Surv. No. 44 1956 : 1-32 8 figs.

Parmalee, P. W. Vertebrate remains from the Cahokia site, Illinois. Trans. Ill. Acad. Sci. 50 : 235-242.

Parrington, F. R. On the nature of the Anaspidia. In "Studies on Fossil Vertebrates" London : 108-128 7 text-figs.

Parrish, B. B. & others. Herring (*Clupea harengus* L.) in aquaria. I. Establishment. Mar. Res. Edinb. No. 5 : 1-11 2 figs.

Parrish, B. B. see Bückmann, A.

Parrott, A. W. Fishes from the Auckland and Campbell Islands. Rec. Dominion Mus. 3 : 109-119.

Parry, G. Size and osmoregulation in salmonid fishes. *Nature, Lond.* **181** : 1218-1219.

Paschalski, J. The feed of *Rutilus rutilus* L. and *Chondrostoma nasus* L. in the Rożnow Dam Water Reservoir. *Polsk. Arch. Hydrobiol.* **5** (18) : 55-64. [English summary.]

Patalas, K. *see* Backiel, T.

Paucă, M. Temoignages du passé géologique, les poissons fossils de la République Populaire Roumaine. *Ocrotirca Nat., București* **2** 1956: 11-30 20 figs.

(Pavlov, P. J.). [On a hybrid between *Abramis brama darmbii* Pavlov and *Rutilus rutilus* L. from the Kitai estuary.] *C.R. Acad. Sci. URSS* **116** 1957: 1039-1040. [In Russian.]

Pavlov, V. & Skirstymonskaja-Krolik, B. On the respiratory function of the blood of the freshwater lamprey. *Trud. Leningr. Obshch. Estestv.* **73** 1957: 235-240 1 fig. [Russian with English summary.]

Pearce, G. *see* Jones, F. R. H.

Peckham, R. S. & Dineen, C. F. Ecology of the central mudminnow, *Umbra limi* (Kirtland). *Amer. Midl. Nat.* **58** 1957: 222-231 1 fig.

Pehrson, T. The early ontogeny of the sensory lines and the dermal skull in *Polypterus*. *Acta zool. Stockh.* **39** : 241-258 14 figs.

Pečárková, K. The number and diameter of eggs in females of brown trout (*Salmo trutta m. fario* L.) and rainbow trout (*Salmo gairdneri irideus* Gibb.) in relation to the size of the females. *Univ. Carol. Prag.* **2** Biol. 1956: 39-56. [German summary.]

Perlmutter, A. & others. Use of the estuarine and sea fish of the family Mugilidae (Grey Mulletts) for pond culture in Israel. *Proc. Fish. Coun. Mediterr. F.A.O.* **4** 1957: 289-304 7 pls.

(Petmshevski, G. K.). [All Soviet Conference on fish diseases.] *Zool. Zh.* **36** 1957: 1911-1912. [In Russian.]

Peyer, B. Über bisher als Fährten gedeutete problematische Bildungen aus den Oligozänen Fischschiefern des Sernftales. *Schweiz. Paläont. Abh.* **73** 1957 1-33 pls. 1-6. 19 text-figs.

Phillips, C. An unusually colored garfish *Lepisosteus platyrhincus*. *Copeia* **1958** : 331-333 1 pl.

Phillips, J. B. (1). A review of the rock-fishes of California. *Fish. Bull. Sacramento No. 104* 1957: 1-158 66 figs.

Phillips, J. B. (2). The fishery for sablefish, *Anoplopoma fimbria*. *Calif. Fish Game* **44** : 79-84 2 figs.

Phillips, J. B. (3). Southerly occurrences of three northern species of fish during 1957, a warmwater year on the California coast. *Calif. Fish Game* **44** : 349-350.

Phillips, J. B. & others. The sable fish fishery of California. *Bull. Pacif. Mar. Fish. Comm.* No. 3 1954: 1-130.

Pickford, G. E. Biological races of Caspian sturgeons. *Syst. Zool.* **4** 1955: 83-85.

Pickford, G. E. & Atz, J. W. The physiology of the pituitary gland of fishes. *New York (New York Zoological Society)* 1957: pp. vii 613 text illust.

Pigoń, A. *see* Grodzinski, Z.

Pikuleva, V. A. *see* Nikolski, G. V.

Pillay, T. V. R. (1). Morphologic and serological characters of the Hilsa, *Hilsa ilisha* (Ham.) with reference to racial investigations. *J. Asiat. Soc. (Sci.)* **20** 1954: 69-74.

Pillay, T. V. R. (2). The biology and fisheries of the hilsa, *Hilsa ilisha* (Hamilton)—A review. *Proc. Indo-Pacif. Fish. Coun. 6th Session 1955 [1956]* : 211-219.

Pillay, T. V. R. (3). Morphological and physiological characters of the blood of Hilsa, *Hilsa ilisha* (Hamilton) of the River Hooghly. *Proc. Indian Acad. Sci.* **47B** : 155-162 1 pl.

Ping, C. & others. The skeletal musculature of the carp (*Cyprinus carpio*). *Acta zool. Sinica* **10** : 289-315 26 figs. [In Chinese, English summary.]

Pinter, H. (1). Der Flussbarsch im Zimmeraquarium. *Aquar. Terrar. Z.* **11** : 65-66 colour-photo.

Pinter, H. (2). *Brachydanio*-Arten. *Aquar. Terrar. Z.* **11** : 289-291 2 black-and-white & colour-photos.

Pinter, H. (3). *Synodontis nigri-ventris* David 1936 und seine Zucht. *Aquar. Terrar. Z.* **11** : 357-359 2 photos.

Pintler, H. E. & Johnson, W. C. Chemical control of rough fish in the Russian River drainage, California. Calif. Fish Game **44** : 91-124 11 figs.

Pinto, J. dos S. Sarcomatose buccale simultanée avec une grande hypertrophie de la thyroïde, chez *Trichiurus lepturus* L. Rev. Fac. Ciênc., Lisbon (2C) **6** : 25-30 4 pls.

Pinto, J. d. S. & Andreu, B. Scale for the determination of evolutive phases of sardine (*Sardina pilchardus* Walb.) ovaries in connection with the histophysiology of the gonad. Proc. Fish. Coun. Mediterr. F.A.O. **4** 1957 : 393-411 4 pls.

Pinto, J. dos S. see Oliveira, J. T. de.

Pinto, S. Y. (1). Sôbre a validade do gênero *Parablennius* Ribeiro, 1915 (Blenniidae, Perciformes, Actinopterygii). Rev. bras. Biol. **17** 1957 : 413-420 15 figs.

Pinto, S. Y. (2). Sôbre a espécie-tipo do gênero "*Hypleurochilus*" Gill, 1861 (Actinopterygii, Perciformes, Blenniidae). Rev. Bras. biol. **18** : 325-332 17 figs.

Pinto, S. Y. see Travassos, H.

Pirson, J. see Springer, V. G.

Pirwitz, W. see Kändler, R.

Pitman, C. R. S. Further notes on aquatic predators of birds. Bull. Brit. ornith. Cl. **77** 1957 : 89-97. 105-110 & 122-126.

Pitt, T. K. (1). Distribution, spawning and racial studies of the capelin, *Mallotus villosus* (Müller), in the off-shore Newfoundland area. J. Fish. Res. Bd. Can. **15** : 275-293 9 figs.

Pitt, T. K. (2). Age and growth of the capelin, *Mallotus villosus* (Müller), from Newfoundland and Grand Bank areas. J. Fish. Res. Bd. Can. **15** : 295-311 8 figs.

Piveteau, J. Les débuts du monde des vertébrés Paris 1951 : 1-23.

Plessis, J. Note préliminaires sur le sang de *Protopterus annectens* (Owen, 1839). Bull. Mus. Hist. nat. Paris (2) **30** : 345-351.

Pleva, V. Die embryonale Entwicklung der Regenbogenforelle (*Trutta gairdneri irideus*). Acta Univ. agric. silv. Brno **6B** : 77-86 17 figs. [Russian & German summaries.]

(Plisetskaya, E. M.) [On the functional properties of smooth muscles of the intestine in poikilothermal vertebrates.] C.R. Acad. Sci. URSS **114** 1957 : 1324-1327 4 figs. [In Russian.]

(Pobedina, V. M.) [Fossil otoliths of fishes from Miocene deposits of Azerbaijan and their stratigraphical significance.] Izvest. Akad. Nauk Azerbaidzhan SSR 1954 No. 10 : 23-37 4 pls. 1 text-fig. [In Russian.]

(Pobedina, V. M. & others.) [Spravochnik po mikrofaune Spedue-n Verkhnenustzenovuckh otlozhenit Azerbaidzhana.] Baku 1956 : 1-191 29 pls. figs.

Poddubny, A. G. Reproduction conditions of *Pelecus cultratus* L. in Rybinsk Water Reservoir. Zool. Zh. **37** : 1701-1709 4 figs.

(Pokrovskaya, T. N.) (1). [Age and growth of cod in Karsk Sea.] Trud. Inst. Okean. **20** 1957 : 302-311 2 figs. [In Russian.]

(Pokrovskaya, T. N.) (2). [On the causes determining contemporary distribution of navaga (genus *Eleginus*). Zool. Zh. **37** : 1181-1194 6 figs. [In Russian with English summary.]

Pokrovski, V. V. see Savina, N. O.

Poll, M. (1). Les genres des poissons d'eau douce de l'Afrique. Ann. Mus. roy. Congo Belge (8vo) **54** 1957 : 1-191 49 pl.

Poll, M. (2). Description d'un poisson aveugle nouveau du Congo Belge, appartenant à la famille des Mastacembelidae. Rev. Zool. Bot. afr. **57** : 388-392.

Poll, M. & Lambert, J. Un Cyprinodontide et un Clariide nouveaux de la grande forêt congolaise. Rev. Zool. Bot. afr. **58** : 328-339 3 figs.

Poll, M. see Brien, P.

Poll, M. see Nybelin, O.

Polyak, S. The vertebrate visual system. Its origin, structure, and function and its manifestations in disease with an analysis of its role in the life of animals and in the origin of man. Preceded by a historical review of investigations of the eye, and of the visual pathways and centers of the brain. Chicago (University Press), 1957 pp. xviii + 1390, 18 pls. frontis. (col.) 546 figs.

Pongsuwana, U. Production of *Tilapia mossambica* in an experimental pond at Bangkok, Thailand. Proc. Indo-Pacif. Fish. Coun. 6th Session 1955 [1956] : 197-201.

Popescu, E. & others. Quelques observations sur la fécondation artificielle et le développement embryonnaire et postembryonnaire de l'ide (*Leuciscus idus* L.). Bul. Inst. Cercet. Pisc. Roman. 17 (2) : 57-64.

Popescu, L. (1). Quelques dates biologiques sur *Abramis sapo* Pallas. Bull. Inst. Cercet. Pisc. Roman. 16 (3) 1957 : 97-100.

Popescu, L. (2). Contributions à la biologie de la brème (*Abramis brama* L.) du Delta du Danube. Bul. Inst. Cercet. Pisc. Roman. 17 (2) : 65-77.

Popiel, J. see Bückmann, A.

Pora, A. L'action de l'adrénaline sur la coloration des poissons benthonique de la mer Noire. Ann. Sci. Univ. Jassy (2) 31 1948 : 91-100 3 figs.

Porumb, I. I. & F. I. Contributions à l'étude de la biologie des poissons pélagiques en face du littoral roumain de la Mer Noire. An. St. Univ. "A.I. Cuza" Iasi. St. nat. N.S. (2) 4 1 : 77-101. [French summary.]

Porcellati, G. see Moretti, G.

Postel, E. (1). Essai sur la Palomette, *Orcynopsis unicolor* (Geoffroy Saint-Hilaire, 1809). Bull. Inst. franç. Afr. N. 18A 1956 : 1220-1248 12 figs.

Postel, E. (2). Sur la présence de *Carcharodon carcharias* (L., 1758) dans les eaux tunisiennes. Bull. Mus. Hist. nat. Paris (2) 30 : 342-344 1 fig.

Postel, E. (3). Contributions à l'étude de la biologie de quelques Scombridae de l'Atlantique tropico-oriental. Bull. Soc. Sci. Bretagne 31 : 107-111.

Postuma, K. H. see Bückmann, A.

Power, E. A. see Anderson, A. W.

Powles, P. M. Studies of reproduction and feeding of Atlantic cod (*Gadus callarias* L.) in the south-western Gulf of St. Lawrence. J. Fish. Res. Bd. Can. 15 : 1383-1402.

Prasad, R. R. Racial analysis of *Clevelandia ios* (Jordan and Gilbert) in Californian waters. Amer. midl. Nat. 59 : 465-476 7 figs.

Price, T. J. see Chipman, W. A.

Prwolnjew, T. I. Die Atmung in der Ontogenese der Fische bei verschiedenem partiellem Sauerstoffdruck. Z. Fisch. 6 N.F., 1957 : 597-603.

(Protasov, V. R.) (1). [Reaction of some Black Sea fish to light.] Vop. Ikhtiol. 9 1957 : 144-146. [In Russian.]

(Protasov, V. R.) (2). [Study on fish sight.] (Brief review of the method.) Ichthyol. Problems 10 : 144-156 3 figs. [In Russian.]

Pruginin, J. see Perlmutter, A.

Pruter, A. T. see Phillips, J. B.

Pushkina, Z. M. see Bukirev, A. I.

Puyo, J. Deux nouveaux poissons du Sénégal. Bull. Soc. Hist. nat. Toulouse 92 1957 : 182-188 2 figs.

Pyefinch, K. A. & Shearer, W. M. The movements of salmon tagged in the sea, Altens, Kincardineshire, 1952. Sci. Invest. Freshwat. Fish., Edinb. 19 1957 : 1-7 1 fig.

Qasim, S. Z. (1). Time and duration of the spawning season in some marine teleosts in relation to their distribution. J. Cons. int. Explor. Mer 21 1956 : 144-155.

Qasim, S. Z. (2). The biology of *Centronotus gunnellus* (L.) (Teleostei). J. Anim. Ecol. 26 1957 : 389-401 1 pl. 6 figs.

Quareshi, M. R. Palla of Sind. J. Asiatic Soc. (Sci.) 20 1954 : 59-60.

Radulescu, I. & Leonte, V. Tumeur chez le flet (*Pleuronectes flesus luscus* L.). Bull. Inst. Cercet. Pisc. Roman 16 (3) 1957 : 101-102 1 fig.

Radulescu, I. & others. Infestation accidentelle du Corégone (*Coregonus lavaretus maraenoides* Poljakow). Bull. Inst. Cercet. Pisc. Roman. 16 (3) 1957 : 95-96.

Radulescu, I. see Nicolau, S. S.

Rae, B. B. The occurrence of Plerocercoid larvae of *Grillotia erinaceus* (van Beneden) in halibut. Mar. Res. Scot. No. 4 : 1-31 6 figs.

Raffy, A. Réactions de *Lepadogaster* à la dessalure. C.R. Soc. Biol. Paris 152 : 41-42.

Rahn, J. Die Fischerei auf dem Sacrower See in den Jahren 1949-1955. Z. Fisch. 6 N.F., 1957 : 561-588 4 figs.

Raj, B. S. Sexual dimorphism in the carp *Barbus (Puntius) curmuca* (Hamilton). Rec. Indian Mus. 53 1955 [1958] : 377-378 1 pl.

Rajchman, L. *see* Devillers, C.

Ralls, R. J. & Halstead, B. W. Moray eel poisoning and a preliminary report on the action of the toxin. Amer. J. trop. Med. Hyg. 4 1955 : 136-140.

Ramaswami, L. S. Skeleton of cyprinoid fishes in relation to phylogenetic studies. 8. The skull and weberian ossicles of Catostomidae. Proc. zool. Soc., Calcutta, Mookerjee memor. vol. 1957 : 293-303 3 figs.

Ramaswami, L. S. & Lakshman, A. B. Spawning catfish with mammalian hormones. Nature, Lond. 182 : 122-123.

Ramaswami, L. S. & Sundararaj, B. I. (1). Inducing spawning in the Indian catfish *Heteropneustes* with pituitary injections. Acta anat. 31 1957 : 551-562.

Ramaswami, L. S. & Sundararaj, B. I. (2). Induced spawning in the catfish *Heteropneustes* with mammalian chorionic gonadotrophins. Acta anat. 32 : 230-234.

Ramirez, E. M. V. Nuevas especies para la fauna ictiologica Venezolana. Bol. Soc. venezol. Cienc. nat. 18 1957 : 157-162 2 pls.

Randall, J. E. (1). A review of ciguatera, tropical fish poisoning, with a tentative explanation of its cause. Bull. mar. Sci. Gulf & Caribbean 8 : 236-267 2 figs.

Randall, J. E. (2). Two new species of *Anampses* from the Hawaiian Islands, with notes on other labrid fishes of this genus. J. Wash. Acad. Sci. 48 : 100-108 4 figs.

Randall, J. E. (3). A review of the labrid fish genus *Labroides*, with descriptions of two new species and notes on ecology. Pacif. Sci. 12 : 327-347 1 pl. 6 figs.

Randall, J. E. & Moffett, A. W. The tarpon has many secrets. Sea Frontiers 4 : 136-146 8 figs.

Raney, E. C. (1). The striped bass in New Jersey. New Jersey Outdoors 6 No. 8 1956 : 1-4.

Raney, E. C. (2). Subpopulations of the striped bass, *Roccus saxatilis* (Walbaum), in tributaries of Chesapeake Bay. Contr. study subpop. fishes Sp. Sci. Rep. No. 208 1957 : 85-107.

Raney, E. C. (3). Natural hybrids between two species of pickerel (*Esox*) in Stearns Pond, Massachusetts. Fish. Rep. Mass. Lakes, Ponds & Reserv. 1951-52 Suppl. (1955) 1957 : 1-15 1 pl. 1 fig.

Raney, E. C. & Woolcott, W. S. Races of the striped bass, *Roccus saxatilis* (Walbaum), in southeastern United States. J. Wildlife Managemt. 19 1955 : 444-450 & Proc. Southeastern Ass. Gam. Fish. Comm. (1954) 1955 : 60-64.

Raney, E. C. & others. Migratory pattern and racial structure of Atlantic coast striped bass. Trans. 19th N. Amer. Wildlife Conf. 1954 : 376-396 2 figs.

Rangarajan, K. Development of the kidney in *Oryzias melastigma* McClelland. J. zool. Soc. India 9 1957 : 130-139 17 figs.

Rao, S. *see* Ganapathi, P. N.

Rasmussen, T. The herring from the Fuglsetfjord—a supplement to "The Osterbo Herring." Fiskeridir. Skr. Havundersøk. 12 No. 2 : 1-8 1 pl.

Rasquin, P. (1). Observations on the metamorphosis of the bonefish, *Albula vulpes* (Linnaeus). J. Morph. 97 1955 : 77-117 29 figs.

Rasquin, P. (2). Cytological evidence for a role of the corpuscles of Stannius in the osmoregulation of teleosts. Biol. Bull. Woods Hole 111 1956 : 399-409 6 figs.

Rasquin, P. (3). Ovarian morphology and early embryology of the pediculate fishes *Antennarius* and *Histrio*. Bull. Amer. Mus. nat. Hist. 114 : 327-372 28 pls. 2 figs.

Rasquin, P. (4). Studies in the control of pigment cells and light reactions in recent teleost fishes. Pts. I & II. Bull. Amer. Mus. nat. Hist. **115** : 1-68 10 pls. 1 fig. 5 tabs.

Rathjen, W. F. *see* Berry, F. H.

Rathjen, W. F. *see* Deubler, E. E.

Ray, C. E. A list, bibliography and index of the fossil vertebrates of Florida. Spec. Pub. Fla. geol. Surv. **3** 1957 : 1-175.

Ray, C. & Coates, C. W. A case of poisoning by the lion fish, *Pterois volitans*. Copeia **1958** : 235.

Ray, S. M. & Wilson, W. B. Effects of unialgal and bacteria-free cultures of *Gymnodinium brevis* on fish. Fish. Bull. U.S. **57** 1957 : 469-496 1 fig.

Raymond, H. L. Effect of pulse frequency and duration in guiding salmon fingerlings by electricity. Res. Rep. U.S. Fish. Serv. No. 43 1956 : 1-19.

Raynaud, P. *see* Serfaty, A.

Rayner, D. H. The geological environment of fossil fishes. In "Studies on Fossil Vertebrates", London : 129-156.

Razzauti, A. *see* Bacci, G.

Rebouças, J. C. & Santos, R. da S. Fauna ictiologica do fosfato de Pernambuco. Bol. Div. Geol. min. Rio de J. **162** 1956 : 1-29 4 pls. figs.

Rechnitzer, A. B. & Böhlke, J. *Ichthyococcus irregularis*, a new Gonostomatine fish from the Eastern Pacific. Copeia **1958** : 10-15 2 pls. 3 figs.

Rechnitzer, A. B. *see* Hubbs, C. L.

Reed, R. J. The early life history of two cyprinids, *Notropis rubellus* and *Campostoma anomalum pullum*. Copeia **1958** : 325-327 1 fig.

Regteren Altena, C. O. van. A second fossil from Schenckher's collection in the Teyler Museum. Centaurus **5** : 370-372 1 fig.

Reichenbach-Klinke, H.-H. (1). Die Fischfauna des östlichen Niedersachsen. Beitr. Naturk. niedersachs. **11** : 69-73.

Reichenbach-Klinke, H. H. (2). Les parasites de la sardine (*Sardina pilchardus* Walb.) et de l'anchois (*Engraulis encrasicolus* Rond.). Rapp. Comm. int. Mer Médit. **14** : 351-353.

Reid, D. F. *see* Boroughs, H.

Reid, G. K. & Hoese, H. D. Size distribution of fishes in a Texas estuary. Copeia **1958** : 225-231 5 figs.

Reid, M. J. & Atz, J. W. Oral incubation in the cichlid fish *Geophagus jurupari* Heckel. Zoologica N.Y. **43** : 77-88 1 pl.

Reimers, N. (1). Some aspects of the relation between stream foods and trout survival. Calif. Fish Game **43** 1957 : 43-69.

Reimers, N. (2). Conditions of existence, growth and longevity of brook trout in a small high-altitude lake of the eastern Sierra Nevada. Calif. Fish Game **44** : 319-333 6 figs.

Remotti, E. La *Gambusia* quale reattivo biologico per lo studio di alcuni problemi di origine neoplastica. Boll. Zool. **23** 1956 : 397-404 3 figs.

Rendahl, H. The original description of the Chinese paradisefish, *Macropodus opercularis* (Linnaeus). Copeia **1958** : 145-146.

Rensch, B. Die Wirksamkeit ästhetischer Faktoren bei Wirbeltieren. Z. Tierpsychol. **15** : 447-461 5 figs.

Rice, T. R. *see* Chipman, W. A.

Richardson, I. D. *see* Muzinic, R.

Richardson, L. R. A new genus and species of Myxinidae (*Cyclostomata*). Trans. Roy. Soc. N.Z. **85** : 283-287 1 fig.

Richey, W. C. Genesis of the vertebrate: Part II. Proc. Pa Acad. Sci. **32** : 211-224 5 figs.

Ridenhour, R. L. Northern pike, *Esox lucius* L., population of Clear Lake, Iowa. Iowa St. Coll. J. Sci. **32** 1957 : 1-18.

Ripplinger, J. *see* Jullien, A.

Ristkok, J. (1). Über die Fischfauna und Fischwirtschaft des Flusses Emajogi. Loodus. Seltsi Aast. **49** 1956 : 161-174 3 figs. [German summary p. 18-20.]

Ristkok, J. (2). Anleitung für ichthyophänologische Beobachtungen. Abiks Loodus. Tartu No. **34** 1957 : 1-22. [German summary.]

Rivas, L. R. The origin, evolution, dispersal, and geographical distribution of the Cuban Poeciliid fishes of the tribe Girardinini. Proc. Amer. phil. Soc. **102** : 281-320 13 figs.

- Rivas, L. R. *see* Harrington, R. W.
- Rivero, L. H. Notas sobre el "pez mariposa" (*Lampris luna*) en Cuba. Contr. Centr. Invest. Pesq. Cuba No. 7 1954 : 1-7.
- Rizkalla, W. *see* Al-Hussaini, A. H.
- Robertson, O. H. Accelerated development of testis after unilateral gonadectomy, with observations on normal testis of rainbow trout. Fish. Bull. U.S. 58 No. 127 : 9-30 33 figs.
- Robins, C. R. (1). Studies on fishes of the family Ophidiidae. I. A new species of *Lepophidium* from the Caribbean Sea. Bull. mar. Sci. Gulf Carib. 8 : 360-368 2 figs.
- Robins, C. R. (2). *Garmannia zebrella*, a new gobiid fish from Trinidad, with notes on the species of the subgenus *Tigriogobius* Fowler. J. Wash. Acad. Sci. 48 : 192-198 1 fig.
- Robins, C. R. & Courtenay, W. R. A deep sea ceratioid angler fish of the genus *Gigantactis* from Florida. Bull. mar. Sci. Gulf Carib. 8 : 146-151 2 figs.
- Robins, C. R. & Manning, R. B. The status and distribution of the fishes of the family Microdesmidae in the Western Atlantic. J. Wash. Acad. Sci. 48 : 301-304.
- Rofen, R. R. The marine fishes of Rennell Island. Nat. Hist. Rennell Is. 1 : 149-218 11 pls.
- Rohrberg, G. Die Fünffleckbuntbarsch *Hemichromis fasciatus* Peters. Aquar. Terrar. Z. 10 1957 : 313-315 1 fig.
- Roland, J. *see* Dieuzeide, R.
- Romer, A. S. (1). The Texas Red-beds and their vertebrate fauna. Studies on Fossil Vertebrates, London : 159-179.
- Romer, A. S. (2). Phylogeny and Behaviour with special reference to vertebrate evolution. Behaviour and Evolution, 1958 : 48-75 8 text-figs. Yale Univ. Press.
- Ronquillo, I. A. Food habits of tunas and dolphins based upon the examination of their stomach contents. Philipp. J. Fish. 2 1954 : 71-83 2 figs.
- Roonwal, M. L. Sunder Lal Hora (1896-1955). Proc. nat. Inst. Sci. India 22B 1957 : 287-303 portr.
- Rosenblatt, R. H. The status and synonymy of the Eastern Pacific eel *Ariosoma gilberti* (Ogilby). Copeia 1958 : 52-54.
- Rosenblatt, R. H. & Baldwin, W. J. A review of the Eastern Pacific sharks of the genus *Carcharhinus*, with a re-description of *C. malpeloensis* (Fowler) and *C. remotus* (Duméril). Calif. Fish Game 44 : 137-159 19 figs.
- Rosenthal, H. L. (1). Uptake and turnover of calcium—45 by the guppy. Science 124 1956 : 571-574 6 figs.
- Rosenthal, H. L. (2). Uptake of calcium—45 and strontium—90 from water by fresh-water fishes. Science 126 1957 : 699-703 3 figs.
- Rosenthal, H. L. (3). The metabolism of strontium—90 and calcium—45 by *Lebistes*. Biol. Bull. Woods Hole, 113 1957 : 442-450 3 figs.
- Rosewald-Rudescu, L. Schilfrohr und Fischkultur im Donaudeelta. Arch. Hydrobiol. 54 : 303-339 2 pls. 6 figs. 7 maps.
- Rossi, L. Contributo alla studio della fauna di profondita' vivente presso la Riviera Ligure di Levante. Doriana 2 (92) : 1-13.
- Rossi-Fanelli, A. & others. Ricerche sulla mioglobina degli invertebrati inferiori. Composizione in aminoacidi della mioglobina e l'emoglobina di "*Thunnus thynnus*." R.C. Accad. Lincei (8) 20 1956 : 737-739 3 figs.
- Rossignol, M. *see* Collignon, J.
- Rotaru, A. *see* Popescu, E.
- Rothausen, K. Marine Vertebraten (Odontaspidae, Lamnidae, Sparidae, Dermochelyidae, Squalodontidae) im oberoligozänen Meeressand von Süchteln und Düsseldorf. Fortschr. Geol. Rhein. u. Westfalen 1-2 : 363-384 4 pls. figs.
- Rothschild, Lord. Fertilization in fish and lampreys. Biol. Rev. 33 : 372-392 4 figs.
- Rounsefell, G. A. (1). Fecundity of North American Salmonidae. Fish. Bull. U.S. 57 No. 122 1957 : 451-468 8 figs.
- Rounsefell, G. A. (2). Factors causing decline in sockeye salmon of Karluk River, Alaska. Fish. Bull. U.S. 58 No. 130 : 83-169 61 figs.

- Rounsefell, G. A. (3). Anadromy in North American Salmonidae. Fish. Bull. U.S. 58 No. 131 : 171-185 2 figs.
- Roux, C. Notes sur la rivière Malela at le lac Sinda dans la région de Loudima (Moyen-Congo). Bull. Mus. Hist. nat. Paris (2) 29 : 467-468.
- Roux, Ch. *see* Collignon, J.
- Roux-Estève, R. *see* Arnoult, J.
- Roy, J. C. & Sahoo, N. Additions to the fish fauna of the Chilka Lake. J. Bombay nat. Hist. Soc. 54 1957 : 949-953 map.
- Roy, R. K. Electron microscopy of the piscine (*Carassius auratus*) renal glomerulus. J. exp. Biol. med. Sci. 36 : 191-209 20 figs.
- Royce, W. F. Observations on the spearfishes of the Central Pacific. Fish. Bull. U.S. 57 No. 124 1957 : 497-554 27 figs.
- Rubinoff, I. Raising the atherinid fish, *Menidia menidia*, in the laboratory. Copeia 1958 : 146-147.
- Ruivo, M. *see* Bougis, P.
- Rukavina, J. & Varenika, D. Air bubble disease of trout at the source of the River Bosna. Acta Ichthyol. Bosniae 3 1956 : 1-12 3 pls.
- Rusconi, C. Lista de los generos y especies fundadas por Carlos Rusconi. Rev. Mus. Hist. nat. Mendoza 9 1956 : 121-156.
- Russell, F. E. & others (1). Electrocardiographic patterns evoked by venom of the stingray. Proc. Soc. exp. Biol. Med. 96 1957 : 634-635.
- Russell, F. E. & others (2). Studies on the mechanism of death from stingray venom. A report of two fatal cases. Amer. J. Med. Sci. 235 : 566-584 6 figs.
- Russell, F. E. & others (3). Some properties of the venom of the stingray. Med. Arts. Sci. 12 : 78-86 3 figs.
- Russo, A. Osservatori marittimi e problemi della pesca costiera in Italia. R.C. Accad. naz. XL (4) 1 1950 : 85-92 14 figs.
- Rybak, B. *see* Cortot, H.
- Ryder, R. A. Occurrence of carp on the north shore of Lake Superior, Port Arthur and Geraldton districts. News Letter Thunder Bay Fd Nat. Cl. 10 1 1956 : 4.
- Sacchi Vialli, G. Considerazioni su alcuni fossili del flysch dell' Appennino Pavese-Tortonese. Atti Ist. Geol. Univ. Pavia 8 : 93-102 figs.
- Sachlan, M. *see* Vaas, K. F.
- Sadoglu, P. Mendelian inheritance in the hybrids between the Mexican blind cave fishes and their overground ancestor. Verh. dtsch. zool. Ges. 1957 [1958] : 432-439 10 figs.
- Sahoo, N. *see* Roy, J. C.
- Saitō, K. Biochemical studies on the fish blood. XIII. On the electrophoretic specificity of serum lipoprotein and glucoprotein. Bull. jap. Soc. sci. Fish. 24 : 531-534. [Japanese with English summary.]
- Saito, M. *see* Suyehiro, Y.
- Saito, N. *see* Hagiwara, S.
- Saito, S. On the mechanism of the appearance of the scale structure. IV. A study on the scale structure of the crucian carp, *Carassius carassius* (L.). Bull. Fac. Fish. Hokkaido Univ. 7 1956 : 85-95.
- Sakano, E. & Miura, I. Marking experiments of young salmon in Hokkaido. Results observed in 1956. Sci. Rep. Hokkaido Salmon Hatchery No. 12 : 63-96. [In Japanese.]
- (Salnikov, N. E.). [Mortality of anchovies in Azov Sea.] Vop. Ikhtiol. 9 1957 : 129-132. [In Russian.]
- Salo, E. O. & Bayliff, W. H. Artificial and natural production of silver salmon, *Oncorhynchus kisutch*, at Minter Creek, Washington. Res. Bull. No. 4 : 1-76 44 figs.
- Salvy, J. *see* Mathias, P.
- Salzen, E. A. Marine fish fauna of the Gold Coast. Nature, Lond. 178 1956 : 1105-1106.
- Sandeman, E. J. Redfish grow slowly. Prog. Rep. Atl. biol. Sta. No. 67 1957 : 26-28 3 figs.
- Sandon, H. Problem fish from Kordofan. Sudan Silva 1 No. 7 1957 : 1-5.
- Sandon, H. & Tayib, A. A. The food of some common Nile fish. Sudan Notes 34 1953 : 205-229.
- Sano, S. & Nagasawa, A. Natural propagation of chum salmon, *Oncorhynchus keta* in Memu river, Tokachi. Sci. Rep. Hokkaido Salmon Hatchery No. 12 : 1-19 including pls. A, B, 1-5. [Japanese with English summary.]

Sano, T. Haematological studies of the culture fishes in Japan. I. On the blood of eel. J. Tokyo Univ. Fish. 43 1957 : 75-79.

Sano, T. *see* Hoshina, T.

Santos, R. da S. *see* Rebouças, J. C.

Sarà, M. Problemi di speciazione negli animali marini. Arch. zool. (ital.) Napoli 42 Suppl. 1957 : 273-379 21 figs.

Saraswati, S. K. *see* Hora, S. L.

Sarma, K. C. On the palaeontology of the Limestone band of the Baripada Beds, Mayurbhanj, Orissa. Quart. J. geol. Soc. India 29 1957 : 103-105 1 pl.

Sathyanesan, A. G. (1). Occurrence of oocyte in adult testis of the fish *Barbus stigma* (Cuv. & Val.). Sci. & Cult. 23 1957 : 203 1 fig.

Sathyanesan, A. G. (2). Studies on the morphology and seasonal histological changes in the pituitary gland of the fresh water teleost *Cirrhhina reba* (Hamilton). Indian J. Vet. Sci. 28 : 13-20 1 pl.

Satō, M. & Kapoor, B. G. Histological observations on the barbels of Indian fresh-water fishes, Alaska codfish and *Podothecus acipenserinus*. Annot. zool. jap. 30 1957 : 156-161 2 figs.

Satō, M. & Yamazaki, G. Preliminary report on the gland-like cells found in the epidermis of the rudiment of the barbel of the Japanese catfish, *Parasilurus asotus*. Zool. Mag., Tokyo 66 1957 : 450-452 2 figs.

Sato, R. On the feeding habits of the young larvae of freshwater and marine fishes. Proc. Indo-Pacif. Fish. Coun. 1955 [1956] : 179-181.

Saunders, J. W. *see* Smith, M. W.

(Savina, N. O. & Pokrovski, V. V.). [The distribution of economic fish in lake Balkhash.] Izv. Fish Inst.: Fishery Resources of Lake Balkhash 37 1956 : 64-90. [In Russian.]

Saxena, D. B. *see* Das, S. M.

Scattergood, L. W. Western North Atlantic records of *Beryx splendens* Lowe and *B. decadactylus* Cuvier and Valenciennes. Copeia 1958 : 231.

Scattergood, L. W. *see* Tibbo, S. N.

Schaefer, M. B. *see* Orange, C. J.

Schaeffer, B. Anatomie de *Latimeria chalumnae*. Science 129 : 1124-1125.

Schapitz, W. (1). Über Verhalten, Pflege und Zucht von *Pyrrhulina vittata*. Aquar. Terrar. Z. 10 1957 : 309-311 figs. 1-4.

Schapitz, W. (2). Das Verhalten von Fischen im Photo. Aquar. Terrar. Z. 11 : 265-267 text-figs. 1-6.

Schapitz, W. (3). *Neolebias ansorgei* (Boulenger) und *Neolebias landgrafi* (E. Ahl). Aquar. Terrar. Z., 11 : 291-294 5 text-figs.

Schilling, J. *see* Becker, E. L.

Schmalhausen, I. I. Nostrils of fish and their fate in terrestrial vertebrates. Zool. Zh. 37 : 1710-1718 5 figs.

Schmidt, D. *see* Leiner, M.

Schmidt, W. Die ersten Agnathen und Pflanzen aus dem Taunus-Gedinnium. Notizbl. hess. Landesamt. Bodenforsch. 86 : 31-49 1 pl. fig.

Schmidt, W. J. (1). Faserung und Durodentin-Metaplasie bei Fischzähnen. Anat. Anz. 105 : 349-360.

Schmidt, W. J. (2). Natürliche Färbung von Reptilien- und Fischzähnen durch Eisenoxyd. Zool. Anz. 161 : 168-178 6 figs.

Schoffeniels, E. (1). A method for studying separately the properties of the innervated and non-innervated membrane of an isolated single electrophax of the skate. Nature, Lond. 181 : 287-288 1 fig.

Schoffeniels, E. (2). Electrical activity of isolated single electrophax of electric eel as affected by temperature. Science 127 : 1117-1118.

Schoffman, R. J. (1). Age and rate of growth of the carp in Reelfoot Lake, Texas, for 1941 and 1956. J. Tenn. Acad. Sci. 32 1 1957 : 3-8 3 figs.

Schoffman, R. J. (2). Age and rate of growth of the yellow bass in Reelfoot Lake, Tennessee for 1955 and 1957. J. Tenn. Acad. Sci. 33 : 101-105 3 figs.

Scholander, P. F. Counter current exchange. A principle in biology. Hvalrad. Skr. 44 : 1-24 11 figs.

Scholander, P. F. *see* Sundnes, G.

Schreiner, K. E. The pancreas-like organ of *Myxine glutinosa*. Avhand. norske Vidensk. Akad. I. Math.-Nat. Kl. 1957 1 1957 : 1-19 16 figs.

Schröder, H. Paarbildung bei *Cichlasoma severum* (Heckel). Aquar. Terrar. Z. 11 : 167-168.

Schroeder, W. C. see Bigelow, H. B.

Schubart, O. see Gomes, A. L.

Schultz, F. H. Investigation of the spawning of northern pike in Prince Albert National Park, Saskatchewan. Wildl. Mgmt. Bull. Can. (3) No. 4 1955 : 1-21 7 figs.

Schultz, F. H. see Guerrier, J. P.

Schultz, L. P. (1). Review of the parrotfishes. Family Scaridae. Bull. U.S. nat. Mus. No. 214 : 1-143 27 pls. 31 figs.

Schultz, L. P. (2). Correction for "The frogfishes of the family Antennariidae" by Leonard P. Schultz, No. 3383, Proc. U.S. National Museum 1957. Copeia 1958 : 147.

Schultz, L. P. (3). Three new serranid fishes, genus *Pikea*, from the western Atlantic. Proc. U.S. nat. Mus. 108 : 321-329 2 figs.

Schultz, L. P. & Axelrod, H. R. The golden tetra, a new species of *Hemigrammus* from British Guiana. Trop. Fish Hobbyist 3 No. 3 1955 : 4-7.

Schwartz, F. J. The breeding behaviour of the southern blacknose dace, *Rhinichthys atratulus obtusus* Agassiz. Copeia 1958 : 141-143.

Schwartz, F. J. & Norvell, J. Food, growth and sexual dimorphism of the redbreast dace *Clinostomus elongatus* (Kirtland) in Linesville Creek, Crawford County, Pennsylvania, Ohio J. Sci. 58 : 311-316.

Schweiger, G. Die toxikologische Einwirkung von Schwermetallsalzen auf Fische und Fischnährtiere. Arch. Fisch. Wiss. 8 1957 : 54-78 5 figs.

Scott, E. O. G. Observations on some Tasmanian fishes: VIII. Pap. roy. Soc. Tasm. 91 1957 : 145-156.

Scott, W. B. (1). Changes in the fish fauna of Ontario. Urquhart & others. Changes in the fauna of Ontario. Toronto (Univ. Press) 1957 : pp. 19-25.

Scott, W. B. (2). A checklist of the freshwater fishes of Canada and Alaska. Toronto (Royal Ontario Museum) : 1-30.

Scuderi, I. Sui caratteri morfologici dell' *Engraulis* del Lago Verde. Boll. Pesca Piscic. Idrobiol. 33 : 232-264.

Sehgal, K. L. On a collection of fish from Assam. J. Bombay nat. Hist. Soc. 53 1956 : 717-724 1 map.

Sekino, K. see Hatanaka, M.

(Semenov, K. I.). [A contribution to the problem of the development stages of the larvae of *Acipenser güldenstädtii*.] C.R. Acad. Sci. URSS 121 : 389-392. [In Russian.]

Sen, A. C. The effect of 2-4D weed-killer on aquatic fauna. Sci. & Cult. 23 1957 : 315-317.

Sepeanu-Firica, M. see Nicolau, S. S.

Serbenyuk, T. V. & Manteifel, Y. B. Some data on physiology of thermoreceptors of fishes. Zool. Zh. 37 : 1854-1860 5 figs.

Serfaty, A. & Raynaud, P. Le réflexe aéro-cardiaque chez le carpe commune (*Cyprinus carpio* L.) et le phénomène d'échappement. Hydrobiologia 12 : 38-42 1 fig.

Serfaty, A. see Broussy, J.

Serfaty, A. see Clos, F.

Sergeant, D. E. The effects and mode of action of external factors regulating reproductive cycles and spawning in teleost fish. Abstr. Diss. Univ. Cambridge 1953-54 1956 : 43-45.

(Serov, N. P.) (1). [Methods of improving the race of carp in lake Balkhash.] Sborn. Rabot. Ikhtiol. Ghidrobiol. 1 1956 : 14-18. [In Russian.]

(Serov, N. P.) (2). [Fishes of lake Chelkar.] Sborn. Rabot. Ikhtiol. Ghidrobiol. 1 1956 : 278-320.

Serpoianu, Gh. see Ionescu, N.

Serra, J. A. & Albuquerque, R. M. On species differences in *Crenilabrus* (Pisces, Perciformes). Rev. portug. Zool. 1 1957 : 1-27.

Seshadri, B. Amylases in mullets. J. Anim. Morph. Physiol. 4 1957 : 43-47 1 pl.

Seshappa, G. Occurrence of growth checks in the scales of the Indian mackerel, *Rastrelliger canagurta* (Cuvier). Curr. Sci. 27 : 262-263 2 figs.

Shapovalov, L. and Taft, A. C. The life histories of the steelhead rainbow trout (*Salmo gairdneri gairdneri*) and silver salmon *Oncorhynchus kisutch*. Fish. Bull., Sacramento No. 98 1954 : 1-375 30 figs.

Sharman, D. P. *see* Bückmann, A.

Shaw, E. Potentially simple technique for rearing germ-free fish. Science 125 1957 : 987-988.

Shchegolev, V. D. *see* Konstantusov, K. G.

Shearer, W. M. The movements of salmon tagged in the sea, Montrose, 1954, 1955. Sci. Invest. Freshwat. Fish., Edinb. 20 : 1-11 2 figs.

Shearer, W. M. *see* Menzies, W. J. M.

Shearer, W. M. *see* Pyefinch, K. A.

Shelbourne, J. E. (1). Site of chloride regulation in marine fish larvae. Nature, Lond. 180 1957 : 920-922 2 figs.

Shelbourne, J. E. (2). Marine fish larvae and the osmotic hazard. Proc. Linn. Soc. Lond. 169 : 65-66.

Shelton, G. *see* Hughes, G. M.

Shelton, J. H. *see* Essex, C. D.

Shih, C. F. *see* Chen, N. S.

Shikama, T. & Okafuji, G. Quaternary cave and fissure deposits and their fossils in Akirjosi district, Yamaguti Prefecture. Sci. Rep. Yokohama nat. Univ. (2) No. 7 : 43-104 15 pls. 30 figs.

(Shileukova, A. K.). [Contributions to the biology of pike in Irpiz-Turgaisk lakes.] Sborn. Rabot. Ikhtiol. Ghidrobiol. 1 1956 : 215-231. [In Russian.]

Shimadate, M. *see* Nakamura, K.

Shimadzu, T. Stocking results of ayu fish (*Plecoglossus altivelis*) in Nuru-River, Gumma Prefecture, 1950 to 1952. Bull. Freshw. Fish. Res. Lab. Tokyo 3 No. 2 1954 : 1-25 9 figs.

Shirahane, G. *see* Kubota, Z.

Shiraishi, Y. & Tokunaga, E. Spawning and its physical environment of pond-smelt (*Hypomesus olidus*) in Lake Sagami. Bull. Freshw. Fish. Res. Lab. Tokyo 8 (1) : 33-43.

(Shirkova, A. P.). [On the biological heterogeneity of *Coregonus lavaretus maraenoides* Poljakow in connection with its introduction into other water reservoirs.] Zool. Zh. 36 1957 : 941-953. [In Russian with English summary.]

(Shkorbatov, G. L.). Experimental basis of fish acclimatization. Zool. Zh. 36 1957 : 230-237. [In Russian with English summary.]

Shoemaker, H. H. (1). Observations of bioluminescence in the Atlantic fish (*Porichthys porosissimum*). Science 126 1957 : 1112.

Shoemaker, H. H. (2). A female ceratioid angler, *Cryptopsaras couesi* Gill, from the Gulf of Mexico, bearing three parasitic males. Copeia 1958 : 143-145 1 fig.

Shojima, Y. *see* Uchida, K.

Siegel, G. Interessante Neuigkeiten über bodenlaichende sudamerikanische Zahnkarpfen. Aquar. Terrar. Z. 11 : 200-202 6 figs.

Silas, E. G. (1). *Garra hughi*, a new Cyprinoid fish from the Western Ghats, Peninsular India, with notes on its bionomics. Rec. Indian Mus. 52 1955 : 1-14 1 pl.

Silas, E. G. (2). Studies on cyprinid fishes of the Oriental genus *Chela* Hamilton. J. Bombay nat. Hist. Soc. 55 : 54-99 2 pls. 6 figs.

Silliman, E. I. A note on the effect of parasite burden on the activity of fish. J. Parasit. 43 1957 : 100.

Silva, P. H. D. H. de (1). On a zoological collecting tour of the islands off Jaffna. J. Bombay nat. Hist. Soc. 54 1957 : 322-334 map.

Silva, P. H. D. H. de (2). The occurrence of *Gonostoma elongata* Gunther and *Xiphasia setifer* Swainson off Ceylon. Spolia zeylan. 28 : 141-144 1 pl.

Silva, P. H. D. H. de (3). The monacanthid genera **Prevagor* and *Paramonacanthus* and the diodontid genera *Chilomycterus* and *Diodon* off Ceylon. Spolia zeylan. 28 : 145-150 1 pl.

*[mis-spelling of *Pervagor*.]

Simionescu, V. *see* Feider, Z.

Simkatis, H. Salt-water fishes for the home aquarium. Philadelphia (J. B. Lippincott) pp. 254 60 figs.

Simpson, D. G. & Gunter, G. Notes on habitats, systematic characters and life histories of Texas salt water cyprinodontes. *Tulane Stud. Zool.* **4** 1956 : 115-134.

Sinclair, G. W. Occurrence of fish in the Ordovician of Canada. *Bull. Geol. Soc. America* **69** : 1644.

Singer, M. *see* Kamrin, R. P.

Sinha, B. M. The pancreas in *Wallago attu* (Bl. & Schn.). *Sci. & Cult.* **23** : 362-363 3 figs.

Skirstymonskaja-Krolik, B. *see* Pavlov, V.

(**Skrobov, V. D.**). [Acclimatization of some fur-bearing animals and commercial fish in the USSR.] *Priroda* **11** : 100-104. [In Russian.]

Skud, B. E. Relation of adult pink salmon size to time of migration and freshwater survival. *Copeia* **1958** : 170-176 3 figs.

Skud, B. E. *see* McKenzie, R. A.

Slack, H. D. & others. The biology of the powan. Studies on Loch Lomond **1** 1957 : 113-127 5 figs.

Slastenenko, E. P. (1). Les poissons de la mer Noire et de la mer d'Azov. *Ann. Sci. Univ. Jassy* **25** Pt. II 1939 : 1-196. [omitted from volume 76, 1939.]

Slastenenko, E. P. (2). The distribution of freshwater fishes in the provinces and main water basins of Canada. *Bull. Shevchenko Sci. Soc.* **1** No. 6 : 1-11.

Slastenenko, E. P. (3). The freshwater fishes of Canada. Toronto 1958 : 1-388 139 figs. map.

Smith, C. L. Additional Pleistocene fishes from Kansas and Oklahoma. *Copeia* **1958** No. 3 : 176-180 3 figs.

Smith, F. G. W. Tracking the elusive tuna. *Sea Frontiers* **3** 1957 : 196-209 8 figs.

Smith, J. L. B. (1). Swordfish, marlin and sailfish in South and East Africa. *Ichthyol. Bull.* No. 2 1956 : 25-34 2 pls. 2 figs.

Smith, J. L. B. (2). The Gunnell-ichthid fishes with description of two new species from East Africa and of *Gunnellichthys (Clarkichthys) bilineatus* (Clark), 1936. *Ichthyol. Bull.* No. 9 : 123-129 2 figs.

Smith, J. L. B. (3). The fishes of the family Eleotridae in the Western Indian Ocean. *Ichthyol. Bull.* No. 11 : 137-163 3 pls. 17 figs.

Smith, J. L. B. (4). Fishes of the families Tetrarogidae, Caracanthidae and Synanciidae from the Western Indian Ocean with further notes on Scorpaenid fishes. *Ichthyol. Bull.* No. 12 : 167-181 2 pls.

Smith, J. L. B. (5). Fishes of Aldabra. Part VIII. *Ann. Mag. nat. Hist.* (12) **10** 1957 : 395-400 2 pls. 1 fig.

Smith, J. L. B. (6). The rare shark *Hemipristis elongatus* (Klunzinger), 1871, from Zanzibar and Mozambique. *Ann. Mag. nat. Hist.* (12) **10** 1957 : 555-560 1 pl. 1 fig.

Smith, J. L. B. (7). A new shark from Zanzibar, with notes on *Galeorhinus* Blainville. *Ann. Mag. nat. Hist.* (12) **10** 1957 : 585-592 2 figs.

Smith, J. L. B. (8). The fishes of Aldabra. Part IX. (with a new eel from East Africa). *Ann. Mag. nat. Hist.* (12) **10** 1957 (1958) : 833-842 2 figs.

Smith, J. L. B. (9). The fishes of Aldabra. Part X. *Ann. Mag. nat. Hist.* (13) **1** : 57-63 1 pl.

Smith, J. L. B. (10). Tetraodont fishes from South and East Africa. *Ann. Mag. nat. Hist.* (13) **1** : 156-160 1 pl.

Smith, J. L. B. (11). The genus *Limnichthys* Waite, 1904 in African seas. *Ann. Mag. nat. Hist.* (13) **1** : 247-249 1 fig.

Smith, J. L. B. (12). New and rare fishes from South Africa. *S. Afr. J. Sci.* **54** : 123-129 1 pl. 2 figs.

Smith, J. L. B. (13). Shark attacks in South Africa. *S. Afr. J. Sci.* **54** : 150-152.

Smith, J. L. B. (14). Rare fishes from South Africa. *S. Afr. J. Sci.* **54** : 319-323 2 figs.

Smith, J. L. B. (15). Primeval terror. *Veld & Vlei* **3** No. 3 : 16-18 4 figs.

Smith, J. L. B. (16). Special feature. *Veld & Vlei* **3** No. 4 : 18-20 6 figs.

Smith, J. L. B. (17). White-tip sharks. *Veld & Vlei* **3** No. 7 : 16-18; 25 4 figs.

Smith, J. L. B. (18). The mystery killer, the new shark *Carcharhinus van-rooyeni*. Veld & Vlei 3 No. 9: 12-14; 28.

Smith, J. L. B. (19). Oddly assorted companions. Veld & Vlei 3 No. 11: 18-19 3 figs.

Smith, J. L. B. (20). The marine fishes of Inhaca. W. Macnae & M. Kalk, Natural History of Inhaca Island, McCambique, Johannesburg: 113-116; 131-137.

Smith, M. A. see Applegate, V. C.

Smith, M. W. (1). Comparative survival and growth of tagged and untagged brook trout. Can. Fish. Cultur. No. 20 1957: [1-6 1 fig. Sep. page.] [also Studies Fish. Res. Bd. Can. 1957, FRB No. 488.]

Smith, M. W. (2). Lea's hydrostatic tag on brook trout and Atlantic salmon smolts. Can. Fish. Cultur. No. 20 1957: [1-6 2 figs. sep. pag.] [also Studies Fish. Res. Bd. Can. 1957 FRB No. 489.]

Smith, M. W. & Saunders, J. W. Movements of brook trout, *Salvelinus fontinalis* (Mitchill), between and within fresh and salt water. J. Fish. Res. Bd. Can. 15: 1403-1449 14 figs.

(Smolyanov, I. I.). [Development of *Stenodus leucichthys* Güld., *Stenodus leucichthys nelme* and *Coregonus lavaretus nelmuschka* Pravdin.] Trud. Inst. morf. Zhiv. 20 1957: 232-294 24 figs. [In Russian.]

Snieszko, S. F. & Bullock, G. L. Treatment of sulfonamide-resistant furunculosis in trout and determination of drug sensitivity. Fish. Bull. U.S. 57 1957: 555-564 2 figs.

Soika, A. G. Prime osservazioni su una elevatissima mortalità di anguille in Valle Serraglia nella Laguna di Venezia provocata dall' *Argulus laticauda* Sm. Rev. Agric. Venez. 1957: 1-10 8 figs.

Solewski, W. (1). The structure and the vascular system of the pseudo-branchia of the rainbow trout *Salmo irideus* Gibb. Folia morph. Warsz. 8 No. 1 1957: 27-33 3 figs.

Solewski, W. (2). Die Entwicklung der Geschlechtsdrüsen bei Karpfen (*Cyprinus carpio* L.) während der ersten drei Lebensjahre. Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 4 1957: 3-24 19 figs. [Polish with German summary.]

Solewski, W. (3). Die Beschaffenheit der Geschlechtsdrüsen der Schleie (*Tinca tinca* L.) im Jahres-Zyklus. Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 4 1957: 25-43 21 figs. [Polish with German summary.]

Solewski, W. (4). Beobachtungen über den Zuwachs der Körperoberfläche und der Atmungsfläche der Kiemen von Karauschen (*Carassius carassius* L.) und Karpfen (*Cyprinus carpio* L.). Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 5 1957: 15-24. [German summary.]

Solewski, W. (5). Beobachtungen über die Entwicklung und das Reifen der Gonaden beim Karpfen (*Cyprinus carpio* L.) im 4-ten Lebensjahr. Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 6: 35-56 29 figs. [Polish with German summary.]

Solewski, W. (6). Verteilung vom Fett im Körper von überwinterndem Karpfenfisch (*Cyprinus carpio* L.). Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 6: 57-68 4 figs. [Polish with German summary.]

Solewski, W. (7). Die Respiration-Oberfläche der Kiemen bei einer und zweisömmerigen Karpfen (*Cyprinus carpio* L.) mit ähnlichen Körpergewicht. Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 7: 17-20. [German summary.]

Solomon, L. see Feider, Z.

Solomon, S. see Becker, E. L.

(Sonina, M. A.). [Coastal industry in Murman 1953-1954]. Trud. Murman biol. Sta. 3 1957: 159-168 9 fig. [In Russian.]

(Sorvachev, K. F.). [Electrophoretic study of the protein fraction of the blood serum in carp raised in ponds under different conditions.] Zool. Zh. 36 1957: 737-741 2 graphs. [In Russian with English summary.]

Spaas, J. T. Contributions to the comparative physiology and genetics of the European Salmonidae. I. Method for the determination of the oxygen consumption in ova, alevins and fishes of different sizes. Hydrobiologia 11: 267-274 3 figs.

- Spaas, J. T. & Heuts, M. J. Contributions to the comparative physiology and genetics of the European Salmonidae. II. Physiologie et génétique du développement embryonnaire. *Hydrobiologia* 12 : 1-26 10 figs. [English summary p. 25.]
- Spatz, W. *Hemichromis bimaculatus* —ein Cichlide. *Aquar. Terrar. Z.* 11 : 193-196.
- Spillmann, J. Sur deux poissons des collections du Muséum, témoins de l'existence au XIX^e siècle, dans le Lac Léman, de Corégones du type "dispersus." *Bull. Mus. Hist. nat.* Paris (2) 30 : 144-145.
- Spillmann, J. *see* Guibé, J.
- Springer, V. G. Systematics and zoogeography of the Clinid fishes of the subtribe Labrisomini Hubbs. *Publ. Inst. mar. Sci. Univ. Tex.* 5 : 417-492 4 figs. 7 pls.
- Springer, V. G. & Hoese, H. D. Notes on records of marine fishes from the Texas coast. *Texas J. Sci.* 10 : 343-348.
- Springer, V. G. & Pirson, J. Fluctuations in the relative abundance of sport fishes as indicated by the catch at Fort Aransas, Texas, 1952-1956. *Publ. Inst. mar. Sci. Univ. Tex.* 5 : 169-185 18 figs.
- Spurway, H. (1). Hermaphroditism with self-fertilization; and the monthly extrusion of unfertilized eggs, in the viviparous fish *Lebistes reticulatus*. *Nature, Lond.* 180 1957 : 1248-1251 4 figs.
- Spurway, H. (2). Heterosis and the evolution of reproductive isolation. *Proc. zool Soc., Calcutta, Mookerjee memor. Vol.*, 1957 : 57-72.
- Squirrel, H. C. New occurrences of fish remains in the Silurian of the Welsh Borderland. *Geol. Mag.* 95 : 328-332 fig.
- Srinivasachar, H. R. (1). Development of the skull in catfishes. Part I. Development of chondrocranium in *Silonia*, *Pangasius* and *Ailia* (Schilbeidae). *Proc. nat. Inst. Sci. India* 22B 1957 : 335-356 8 figs.
- Srinivasachar, H. R. (2). Development of the skull in catfishes. Part II. Development of the chondrocranium in *Mystus* and *Rita* (Bagridae). *Gegenbaurs Jb.* 98 1957 : 244-262.
- Srinivasachar, H. R. (3). Development of the skull in catfishes. Pt. 4. *Gegenbaurs Jb.* 99 : 986-1016 10 figs.
- Srinivasachar, H. R. (4). Development of the skull in catfishes. Part V. Development of skull in *Heteropneustes fossilis* (Bloch). *Proc. nat. Inst. Sci. India* 24B : 165-190 11 figs.
- Srivastava, P. N. (1). The air bladder of Mugilidae and the relationship of the oval and pneumatic duct. *Trans. Amer. micr. Soc.* 76 1957 : 346-352 16 figs.
- Srivastava, P. N. (2). Features of anatomical interest in the alimentary canal of *Chirocentrus dorab* (Forsk.). *Curr. Sci.* 26 1957 : 149-150 1 fig.
- Srivastava, P. N. (3). Primitive features in the alimentary canal of *Gadusia chapra* (Hamilton). *Curr. Sci.* 27 : 144-145 2 figs.
- Stagg, M. W. *see* Goss, R. J.
- Stahl, A. Recherches sur les élaborations cellulaires et la neurosécrétion dans l'encéphale des poissons téléostéens. *Acta anat. Suppl.* 28 1957 : 1-158 8 pls. col. 140 figs.
- Stammer, A. Structure and innervation of the eye-muscles of fresh-water osseous fishes. *Allat. Kozl.* 46 1957 : 115-123 21 figs. [English summary.]
- Stănescu, S. Données sur la biologie du requin de la mer Noire. *Hidrobiol., Bucuresti* 1 : 103-139. [French summary.]
- Stănescu, S. *see* Jonescu, N.
- Stangenberg, K. Summer feed of roach in mesotrophic and dystrophic lakes. *Polsk. Arch. Hydrobiol.* 4 (17) : 251-275 1 fig. [English summary.]
- Starmach, J. Beobachtungen des Abblaihens von Karpfen und der Entwicklung des Karpfenlaichs. *Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 5* 1957 : 3-14 4 pls. [Polish with German summaries.]
- Stavenhagen, L. *see* Hubbs, Clark.
- Steele, D. H. The redfish (*Sebastes marinus* L.) in the western Gulf of St. Lawrence. *J. Fish. Res. Bd. Can.* 14 1957 : 899-924 11 figs.
- Stefan, G. Noi contributiuni la cunoasterea ritmului de crestere al scobarului (*Chondrostoma nasus* L.) din Transilvania. *Bul. Inst. Cercet. Pisc. Roman.* 16 (3) 1957 : 59-68.

(Stefan, M.). [Physiological analysis of the interrelation between the gas exchange and shoal behaviour of certain marine and fresh-water species. Zool. Zh. **37** : 222-228 4 figs. [In Russian with English summary.]

Stenholt-Clausen, H. Correlation entre distribution ichthyofaunique et distribution des dépôts géologiques en Nigeria du sud-ouest (Afrique occidentale). Vie et Milieu **8** : 329-330.

Stensiö, E. A. Les Cyclostomes fossiles. In P. P. Grassé "Traité de Zoologie," **13** : 173-425 112 figs.

Sterba, G. (1). Das Adrenal- und Internealsystem im Lebensablauf von *Petromyzon planeri* Bloch. Zool. Anz. **155** 1955 : 151-168 7 figs.

Sterba, G. (2). Die Schmerlenartigen (Cobitidae). in Demoll & Maier, Handb. Binnenfisch. mittel-europ. Bd. III Lief 9 : pp. 201-234 28 figs.

Sterba, G. (3). Die Eihüllen des Schmerlen- Eies. (*Nemachilus barbatula* L.). Z. mikr. anat. Forsch. **63** : 581-588 4 figs.

Sterne, T. E. Ontogeny of hemoglobin in the skate *Raja binoculata*. Science **128** : 419-420 2 figs.

Stinson, N. E. The food and growth of brown trout (*Salmo trutta* L.) in three rivers in Co. Tyrone. Proc. roy. Irish Acad. **59B** : 129-154 3 figs.

Stinton, F. C. Fish otoliths from the Tertiary strata of Victoria, Australia. Proc. roy. Soc. Vict. N.S. **70** : 81-93 1 pl.

Stix, W. Vergleichende Untersuchungen an der Trigeminusmuskulatur der Siluridae (Teleostei). Gegenbaurs Jb. **97** 1956 : 45-76 18 figs.

Stoica, N. see Dumitrescu, M.

Stokely, P. S. see Hofstetter, A. M.

Stolk, A. (1). Plecospondylic spinal column in the eel *Anguilla anguilla*. Beaufortia **5** 1956 : 143-148 3 figs.

Stolk, A. (2). Some species-specific tumours in fishes. Experientia **14** : 245.

Stolk, A. (3). Pathological parthenogenesis in viviparous toothcarps. Nature, Lond. **181** : 1660.

Stolk, A. (4). Extra-regional oocytes in teleosts. Nature, Lond. **182** : 1241

Stolk, A. (5). Tumours of fishes XX-XXI. Proc. Akad. Wet. Amst. **61C** : 101-114 11 figs.

Stolk, A. (6). Tumours in fishes. XXII. Proc. Akad. Wet. Amst. **61C** : 201-206 6 figs.

Stolk, A. (7). Tumours of fishes. XXIII A-B, XXIV. Proc. Akad. Wet. Amst. **61C** : 363-394 23 figs.

Stolk, A. (8). Special condition of the interphase nucleus in normal and tumorous cells of fishes, amphibians and reptiles. IA-B. Proc. Akad. Wet. Amst. **61C** : 395-416 12 figs.

Stolk, A. (9). Tumours of fishes. XXV. Proc. Akad. Wet. Amst. **61C** : 499-514 12 figs.

Stolk, A. (10). Presence of extra-regional oocytes in Teleosts. Proc. Akad. Wet. Amst. **61C** : 515-529 11 figs.

Stoll, L. M. Changes in the cytological structure of the adenohypophysis and gonads in juvenile *Bathygobius soporator* after pituitary implantation. Zoologica, N.Y. **42** 1957 : 99-104 2 pls.

Stolzenhain, F. Wann holen Labyrinthfische zum ersten Male Luft? Aquar. Terrar. Z. **11** : 139-141.

Strahan, R. The velum and the respiratory current of *Myxine*. Acta zool. Stockh. **39** : 227-240 5 figs.

Strasburg, D. W. (1). Some aspects of the biology of the Central Pacific great blue shark. Proc. Hawaii. Acad. Sci. No. 32 1957 : 28.

Strasburg, D. W. (2). Distribution, abundance and habits of pelagic sharks in the central Pacific Ocean. Fish. Bull. U.S. **58** (138) : 335-361 20 figs.

Strasburg, D. W. & Hiatt, R. W. Sexual dimorphism in the labrid fish genus *Gomphosus*. Pacif. Sci. **11** 1957 : 133-134.

Strawn, K. Life history of the pigmy sea-horse, *Hippocampus zosterae* Jordan and Gilbert, at Cedar Key, Florida. Copeia **1958** : 16-22 4 figs.

Strawn, K. see Hubbs, Clark.

(Strelkovsky, V. I.). [On the formation of a link between the hyoid and the mandibular arches in the ontogeny of *Acipenser guldenstädti*. C.R. Acad. Sci. URSS **115** 1957 : 403-406 2 figs. [In Russian.]

Strzyzewska, K. The stock of spawning pike (*Esox lucius* L.) in the Firth of Vistula. Prace morsk. Inst. ryback. No. 9 1957: 247-258. [In Polish, English summary.]

Stuart, T. A. (1). The migrations and homing behaviour of brown trout (*Salmo trutta* L.). Sci. Invest. Freshwat. Fish., Edinb. **13** 1957: 1-27.

Stuart, T. A. (2). Marking and regeneration of fins. Sci. Invest. Freshwat. Fish. Res. Edinb. **22**: 1-14 8 figs.

Suarez-Caalvo J. A. see Duarte-Bello, P. P.

Sublette, J. E. see Hancock, C. D.

Sublette, M. G. The morphology of the post-pharyngeal alimentary canal of the white bass, *Morone chrysops* (Rafinesque). Texas J. Sci. **8** 1956: 444-462 9 figs.

Sufi, S. M. K. (1). Occurrence of fishes of the genus *Glyptothorax* in Peshawar and Hyderabad divisions of West Pakistan. Pakist. J. Sci. **9** 1957: 170-172.

Sufi, S. M. K. (2). Occurrence of the fish *Chela labruca* (Ham.) in the Hyderabad and Khairpar divisions of West Pakistan, with notes on the synonyms of *Chela cachius* (Ham.). Pakist. J. sci. Res. **10**: 62-64.

Sullivan, C. M. see Fisher, K. C.

Sundararaj, B. I. The seminal vesicles and their seasonal changes in the Indian catfish. Copeia **1958**: 289-297 13 figs.

Sundararaj, B. I. see Ramaswami, L. S.

Sundnes, G. Notes on the energy metabolism of the cod (*Gadus callarias* L.) and the coalfish (*Gadus virens* L.) in relation to body size. Fiskeridir. Skr. Havundersøk. **11** No. 9 1957: 1-10 5 figs.

Sundnes, G. & others. Gas secretion in fishes lacking rete mirabile. J. exp. Biol. **35**: 671-676 1 pl. 4 figs.

Suntur, S. R. Transport of fish for short trips by sea at medium temperature. Proc. Fish. Council. Mediterr. F.A.O. **4** 1957: 413-415.

Suttkus, R. D. (1). Seasonal movements and growth of the Atlantic croaker (*Micropogon undulatus*) along the East Louisiana coast. Proc. Gulf & Caribb. Fish. Inst. 7th Ann. Sess. Miami 1954: 1-7 (sep. pag.).

Suttkus, R. D. (2). Status of the nominal cyprinid species *Moniana deliciosa* Girard and *Cyprinella texana* Girard. Copeia **1958**: 307-318 8 figs.

Suyama, M. Changes in the amino acid composition of protein during the development of rainbow trout eggs. Bull. jap. Soc. sci. Fish. **23**: 789-792. [Japanese with English summary.]

Suyama, M. & Ogino, C. Changes in chemical composition during development of rainbow trout eggs. Bull. jap. Soc. sci. Fish. **23**: 785-788. [Japanese with English summary.]

Suyama, M. & Uno, Y. Puffer toxin during the embryonic development of puffer, *Fugu* (*Fugu niphobles* (J. et S.)). Bull. jap. Soc. sci. Fish. **23** 1957: 438-441. [Japanese with English summary.]

Suyehiro, Y. & others. Movements of the fish in response to sound stimuli with reference to sound-intensity. Jap. J. Ichth. **6** 1957: 136-140 1 fig.

Suzuki, K. see Okada, Y.

Svårdson, G. (1). Skeppträsklöjan. Svensk Fisk. Tidskr. **66** No. 3, 1957: 37-42 4 figs.

Svårdson, G. (2). Interspecific hybrid populations in *Coregonus*. Uppsala Univ. Arsskr. **1958**: 231-239 7 figs.

Svårdson, G. (3). Tvillingaster bland brackvattnsfiskarna. Fauna och Flora **53**: 150-174 3 figs.

Svetina, M. The grayling and its artificial spawning (Practical results obtained in Yugoslavia). Proc. Fish. Council. Mediterr. F.A.O. **4** 1957: 377-381.

(Svetovidov, A. N.) (1). [On the Black Sea species of the genus *Scorpaena*.] C.R. Acad. Sci. URSS **117** 1957: 910-913 2 figs. [In Russian.]

(Svetovidov, A. N.) (2). [On the causes of difference in the rate of growth of the Clupeoids of the Caspian and the Black and Azov Seas.] Zool. Zh. **36** 1957: 1735-1745 map. [In Russian with English summary.]

(Svetovidov, A. N.) (3). [The Blennioid fishes of the Black Sea.] Zool. Zh. **37** : 584-593 3 figs. [In Russian with English summary.]

Swarup, H. (1). Production of heteroploidy in the three-spined stickleback, *Gasterosteus aculeatus* (L.). Nature, Lond. **178** 1956 : 1124-1125.

Swarup H. (2). The morphology of the skull of *Ophicephalus punctatus* (Bloch). J. Univ. Saugar **1** 1956 : 111-122 5 figs.

Swarup, H. (3). Apparatus for rearing early stages of fish. J. Univ. Saugar **6** 1957 : 99-100 1 fig.

Swarup, H. (4). Stages in the development of the stickleback *Gasterosteus aculeatus* (L.). J. Embryol. exp. Morph. **6** : 373-383 31 figs.

Swedmark, M. Sur la variation géographique de *Gobius minutus* Pallas. I.—Biologie et croissance. Arch. Zool. exp. gén. **95** (Notes et Rev.) : 32-51 6 figs.

Swift, D. R. Seasonal variations in growth rate, thyroid gland activity and food reserves of brown trout (*Salmo trutta* Linn.). J. exp. Biol. **32** 1955 : 751-764 5 figs.

Sykes, J. E. see Talbot, G. B.

Szabo, T. Un centre bulbaire particulier chez deux types différents de poissons électriques de la famille des Mormyridés. C.R. Acad. Sci. Paris **244** 1957 : 1265-1267 2 figs.

Szabo, Z. Beiträge zur Vermehrungsbiologie der Nase (*Chondrostoma nasus* L.). Z. Fisch. **7** N.F. : 631-636.

Sze-chung, L. On a new fish, *Lembeichthys furcicaudalis* sp. nov. (Blenniidae) from South China Sea. Acta zool. Sinica **9** 1957 : 227-232 1 pl. [English résumé.]

Tabata, K. see Matsue, Y.

Taborski, A. Maroniacara, *Aequidens maronii* Steindachn.). Przegl. zool. **1** 1957 : 341-342 1 fig. [In Polish.]

Taft, A. C. see Shapovalov, L.

Tait, J. S. see Garside, E. T.

Takagi, K. Descriptions of some new gobioid fishes of Japan, with a proposition on the sensory line system as a taxonomic appliance. J. Tokyo Univ. Fish. **43** 1957 : 97-126 8 figs.

Takagi, K. & Kobayashi, Y. Vertebral characters of a congrid fish, *Astroconger myriaster*, taken from Tokyo Bay. J. Tokyo Univ. Fish. **44** : 51-55.

Takahashi, K. see Hiroasaki, Y.

Takahashi, M. & Hatanaka, M. Experimental studies on the utilization of food by young mackerel, *Pneumatophorus japonicus* (Houttuyn). Bull. jap. Soc. sci. Fish. **24** : 449-455. [Japanese with English summary.]

Takahashi, M. see Hatanaka, M.

Takahashi, T. see Hoshina, T.

Takano, H. Mackerel fishing by 'Hanezuri' around the western entrance to the Tsugaru straits. Bull. Tokai Fish. Res. Lab. No. 16 1957 : 1-5.

Takashima, Y. see Abe, T.

Talbot, G. B. & Sykes, J. E. Atlantic coast migrations of American shad. Fish. Bull. U.S. **58** : 473-490 6 figs.

(Taliev, D. N.). [The Cottoidei of Lake Baikal.] Acad. Sci. USSR Moscow & Leningrad 1955 : 603 pp. 179 fig. [In Russian.]

(Tambovtzev, B. M.). [Small-vertebrae herring in Berents and White Seas.] Trud. Murman. biol. Sta. **3** 1957 : 169-174. [In Russian.]

Tammes, P. M. L. Observations on the effect of temperature on the balance between entry of a poison and the process of detoxification. Physiol. comp. **4** 1957 : 277-294.

Tampi, P. R. S. Some observations on the reproduction of the milkfish *Chanos chanos* (Forskål). Proc. Indian Acad. Sci. **46B** 1957 : 254-273 3 pls. 10 figs.

Tamura, T. see Hotta, H.

Taranetz, A. Y. see Makushok, V. M.

Tarashchuk, V. I. Remains of *Pagellus* (fam. Sparidae, Pisces) from the Neogen deposits of Ternopol Region. Rep. Acad. Sci. Ukraine **6** 1957 : 619-623 2 figs. [English summary.]

(Tarasov, N. I.). [Balanophagous fishes.] Priroda **9** : 105-106. [In Russian.]

Tarlo, L. B. Exhibition of Emsian Ostracoderms from Poland. Proc. Geol. Soc. London **1564** : 7-9.

- Tarr, H. L. A.** Biochemistry of fishes. Stud. Fish. Res. Bd. Can. No. 517. [reprinted from Ann. Rev. Biochem. 27 : 223-244.]
- Tarr, H. L. A.** *see* Idler, D. R.
- Tarwid, K.** *see* Backiel, T.
- Tavani, G.** Osservazioni su alcuni Plectognathi (Gymnodonti). Atti Soc. tosc. Sci. nat. 62A 1 1955 : 177-200 2 pls.
- Tavolga, W. N. (1).** Underwater sounds produced by two species of toadfish, *Opsanus tau* and *Opsanus beta*. Bull. mar. Sci. Gulf & Caribbean 8 : 278-284 2 figs.
- Tavolga, W. N. (2).** A tidal zone resident. Nat. Hist. N.Y. 67 : 156-164 17 figs.
- Tavolga, W. H. (3).** The significance of underwater sounds produced by males of the gobiid fish, *Bathygobius soporator*. Physiol. Zool. 31 : 259-271 1 fig.
- Tayib, H. A.** *see* Sandon, H.
- Taylor, C. C. (1).** Natural mortality rate of Georges Bank haddock. Fish. Bull. U.S. 58 No. 126 : 1-7 1 fig.
- Taylor, C. C. (2).** Cod growth and temperature. J. Cons. int. Explor. Mer 23 : 366-370.
- Taylor, C. C. & others.** Climatic trends and the distribution of marine animals in New England. Fish. Bull. U.S. 57 1957 : 293-345 29 figs.
- Taylor, F. H. C. & others.** The status of the major herring stocks in British Columbia in 1956-57. Rep. B.C. Dept. Fish., 1956 : K45-K77. [also Stud. Fish. Res. Bd. Can. 1957 FRB No. 500.]
- Tchang, T.-l.** The distribution of Chinese clupeoid fishes. Acta zool. Sinica 9 1957 : 339-344.
- Teichmann, H. (1).** Defektstufen von nase und auge bei fehlgebildeten larven der regenbogenforelle (*Salmo irideus* W. Gibb.) Roux Arch. Entw. Mech. Organ. 149 1957 : 365-386.
- Teichmann, H. (2).** Geruchsdressuren beim Aal (*Anguilla anguilla* L.) Verh. dtsh. zool. Ges. 1957 [1958] : 298-303 4 figs.
- Temple, R. F.** *see* Tibbo, S. N.
- Templeman, W. (1).** How cod spawn—Nielsen's observations. Progr. Rep. Atl. biol. Sta. No. 68 : 15-16.
- Templeman, W. (2).** Distribution of the inshore catch of cod in Newfoundland and Labrador waters in the years 1947 to 1949. Progr. Rep. Atl. biol. Sta. No. 70 : 3-9.
- Templeman, W. (3).** Grand Bank tagged dogfish moves to Iceland. Progr. Rep. Atl. biol. Sta. No. 70 : 28-30 2 figs.
- Templeman, W. & Hodder, V. M.** Variation with fish length, sex, stage of sexual maturity and seasons in the appearance and volume of the drumming muscles of the swim-bladder in the haddock, *Melanogrammus aeglefinus* (L.). J. Fish. Res. Bd., Can. 15 : 355-390 22 figs.
- Tesch, F. W.** Weiterer Fund eines Steines in der Leibeshöhle eines Aales (*Anguilla vulgaris* Turton). Nachr. naturw. Mus. Aschaffenburg No. 60 : 61-62 1 pl.
- Theobald, N.** Les poissons fossiles du Permien inférieur de la Sarre. Ann. Univ. sabariensis. Sci. 7 : 211-214 1 pl.
- Thines, G. (1).** Beobachtungen über die phototaxis und die thermotaxis des blinden Höhlenfisches *Caecobarbus gaertsi* (Blgr) (Cyprinidae). Experientia 14 : 381-382 1 fig.
- Thines, G. (2).** Observations sur les habitats de *l'Uegitglanis zammaraoui* Gianferrari 1923, Clariidae aveugle de la Somalie Italienne. Rev. Zool. Bot. afr. 57 : 117-124 2 figs.
- Thines, G. L.** *see* Marshall, N. B.
- Thomas, A. E.** The cranial muscles of teleosts.—2. J. anim. Morph. Physiol. 5 : 1-20 24 figs.
- Thomas, G. J.** *see* Otis, L. S.
- Thomas, P. K. (1).** Growth changes in the myelin sheath of peripheral nerve fibres in fishes. Proc. roy. Soc. 143B 1955 : 380-391 7 figs.
- Thomas, P. K. (2).** Growth changes in the diameter of peripheral nerve fibres in fishes. J. Anat., Lond. 90 1956 : 5-14 3 figs.

Thomopoulos, A. Sur la ligne latérale des Téléostéens. II. La cupule et les neuromastes chez des embryons et des larves planctoniques d'espèces marines. Bull. Soc. zool. Fr. **82** 437-442 4 figs.

Thompson, J. R. see Arnold, E. L.

Thomson, J. M. (1). Biological studies of economic significance of the yellow-eye mullet, *Aldrichetta forsteri* (Cuvier and Valenciennes) (Mugilidae). Aust. J. mar. & freshw. Res. **8** 1957 : 1-13 4 figs.

Thomson, J. M. (2). Interpretation of the scales of the yellow-eye mullet, *Aldrichetta forsteri* (Cuvier and Valenciennes). (Mugilidae). Aust. J. mar. & freshw. Res. **8** 1957 : 14-28 2 pls. 5 figs.

Thomson, J. M. (3). The size at maturity and spawning time of some Western Australian estuarine fishes. Fish. Bull. W. Aust. No. **8** 1957 : 1-8.

Thomson, J. M. (4). The penetration of estuarine fish into freshwater in the Albert River. Proc. roy. Soc. Qd. **68** 1957 : 17-20 1 fig.

Thorson, T. B. Measurement of the fluid compartments of four species of marine chondrichthyes. Physiol. Zool. **31** : 16-23.

Threadgold, L. T. A histochemical study of the shell gland of *Scyliorhinus caniculus*. J. Histochem. & Cytochem. **5** : 159-166 1 fig.

Thurow, F. (1). Über den Trocken-substanz- und Fettgehalt von Aalen aus der Kieler Bucht und der Kieler Förde. Arch. Fisch. Wiss. **8** 1957 : 79-93 7 figs.

Thurow, F. (2). Untersuchungen über die spitz- und breitzköpfigen Varianten des Flusssaales. Arch. Fisch. Wiss. **9** : 79-97 12 figs.

Tibbo, S. N. & others. On the occurrence and distribution of larval herring (*Clupea harengus* L.) in the Bay of Fundy and the Gulf of Maine. J. Fish. Res. Bd. Can. **15** : 1451-1469.

Tibbo, S. N. see McKenzie, R. A.

Tiemeier, O. W. Notes on stunting and recovery of the channel catfish. Trans. Kansas Acad. Sci. **60** 1957 : 294-296.

Toi, J. see Nakamura, K.

Tokue, Y. see Tozawa, H.

Tokunaga, E. see Shiraishi, Y.

Tolentino, A. R. & Clemente, L. S. The skeletal system of three species of sea catfish. Nat. appl. Sci. Bull. **13** 1953 : 67-101 10 pls.

Tolg, I. Gyakori garatfogrendellenesség a Balaton dévérkeszeg (*Abramis brama* L.) állományában. Ann. Inst. biol. hung. Acad. Sci. **25** : 77-81 1 pl. [German and Russian summaries.]

Tominaga, K. see Inaba, D.

Tomiyama, I. Some rare fishes from Sagami Bay, Japan. Annot. zool. jap. **31** : 49-52.

Tomiyama, I. & Abe, T. Figures and descriptions of the fishes of Japan. Tokyo **57** : 1171-1194 3 pls.; **58** : 1195-1219 4 pls.; **59** : 1221-1247 2 pls.

Topalá, N. see Jitariu, P.

Torbett, H. D. Carp variety nomenclature problems. Fishing Gazette **140** : 727-729 5 figs.; 743-744 2 figs.

Torchio, M. (1) Insolito reperto di *Maurolicus muelleri* (Gm.) (Pisces Gonostomatidae) nel Mar Ligure. Boll. Ist. Zool. Univ. Torino **4** 1953-54 [1955] : 197-199.

Torchio, M. (2). I Myctophidae (Pisces) presenti nel Mar Ligure. Doriania **2** (91) : 1-6.

Tortonese, G. (1). I pesci del Parco Nazionale del Gran Paradiso (Alpi Graie). Boll. Ist. Zool. Univ. Torino **4** 1953-54 [1955] : 95-117 2 figs. 1 pl.

Tortonese, E. (2). Sull' identità della *Cerna sicana* Döderlein. Boll. Zool. **23** 1956 : 51-55.

Tortonese, E. (3). Mimetismo mülleriano e rapporti filogenetici. Boll. Zool. **23** 1956 [1957] : 721-725 1 fig.

Tortonese, E. (4). Studi sui Plagiostomi. IX. Descrizione di un embrione di *Mobula mobular* (Bonn.). Boll. Zool. **24** 1957 : 45-47 1 fig.

Tortonese, E. (5). Su alcuni pesci eritrei e somali del museo civico di storia naturale di Venezia. Bol. Mus. Civ. Stor. nat. Venezia **10** 1957 : 121-128 3 pls.

Tortonese, E. (6). Brevi considerazioni sui Pesci Mediterranei del Sottordine *Sgombroidi*. Boll. Ist. Zool. Univ. Torino **5** 1957 : 53-61.

Tortonese, E. (7). Studi sui Plagiotomi. VIII. I pristis del Museo Civico di Genova. *Doriana* 2 No. 81 1957 : 1-7.

Tortonese, E. (8). Cattura di *Trachypterus cristatus* Bon. e note sui Trachypteridae del Mare Ligure. *Doriana* 2 No. 89 : 1-5.

Tortonese, E. (9). Primo ritrovamento di *Anarhichas lupus* (L.) (Pisces) nel Mediterraneo (Golfo di Genova). *Doriana* 2 No. 94 : 1-4 2 figs.

Tortonese, G. (10). Primo reporto figure di un raro mictofide: *Diaphus metoplocampus* (Cocco). (Pisces Iniomi). *Ann. Mus. Stor. nat. Genova* 70 : 71-72.

Tortonese, E. & Arbocco, G. Pesci dell' Africa occidentale raccolti dal Prof. Edoardo Zavattari. *Doriana* 2 No. 87 : 1-6 2 figs.

Tourrasse, G. de La. La pêche au thon sur la côte basque poursuit sa modernisation. *Rev. Trav. Inst. Pêches marit.* 21 1957 : 561-592 15 figs.

Towarnicki, R. Vascularization of the pineal body of the pike. *Folia morph. Warszawa* 5 1957 : 287-306.

Townsley, S. J. *see* Burroughs, H.

Tozawa, H. & others. Studies on the radioactivity in certain pelagic fish—V. Confirmation and determination of radioactive elements in contaminated fishes caught in 1956 (Part 1). *Bull. Jap. Soc. Sci. Fish.* 23 1957 : 335-341 3 figs. [Japanese with English summary.]

Trasarti, F. *see* Rossi-Fanelli, A.

Trautman, M. B. The fishes of Ohio with illustrated keys. [Columbus] Ohio State Univ. Press. 1957 pp. xviii, 683 7 pls. col. 172 figs. 172 maps.

Travassos, H. (1). Sôbre o gênero *Deuterodon* Eigenmann, 1907 (Characoidei-Tetragonopteridae). *An. Acad. bras. Cienc.* 29 1957 : 73-101 25 figs.

Travassos, H. (2). Sôbre o material ictiológico coletada na excursão do zonas das estradas de Ferro Noroeste do Brasil e Brasil-Bolívia, nos estados de São Paulo e de Mato Grosso, Brasil e Bolívia oriental. *Publ. avuls. Mus. nac. Rio de J. No.* 20 1957 : 21-27.

Travassos, H. (3). Sôbre um novo *Parodontinae* do estado de Goiás, Brasil (Cypriniformes, Characoidei.) *Rev. brasil. Biol.* 17 1957 : 147-151 3 figs.

Travassos, H. & Pinto, S. Y. (1). Estudos sôbre a família Cichlidae. I. (Perciformes-Actinopterygii). *Bol. Mus. nac. Rio de J. Zool. No.* 175 : 1-9 20 figs.

Travassos, H. & Pinto, S. Y. (2). Estudos sôbre a família Cichlidae II. *Bol. Mus. Goeldi (Zool.) No.* 13 : 1-24 3 pls.

Travassos, L. & H. Excursão científica realizado nas zonas da estrada de Ferro Noroeste do Brasil e Brasil-Bolívia em Janeiro e Fevereiro de 1955. *Publ. avuls. Mus. nac. Rio de J. No.* 20 1957 : 5-19.

Trewavas, E. (1). Nominomania. *Ann. Mag. nat. Hist.* (12) 10 1957 : 349-350.

Trewavas, E. (2). The Coelacanth yields its secrets. *Discovery* 19 : 196-205 8 figs.

Trinkaus, J. P. & Drake, J. W. Exogenous control of morphogenesis in isolated *Fundulus* blastoderms by nutrient chemical factors. *J. exp. Zool.* 132 1956 : 311-347 2 pls. 5 figs.

Trout, G. C. (1). The Bear Island cod migrations and movements. *Fish. Invest. Lond.* (2) 21 No. 6 1957 : 1-51 40 figs.

Trout, G. C. (2). Results of English cod tagging in the Barents Sea. *J. Cons. int. Explor. Mer* 23 : 371-380.

Tsai, C. *see* Chu, K.

Tschörtner, U. Untersuchungen über den Einfluss einiger Milieufaktoren auf die Entwicklung des Hechtes (*Esox lucius* L.). *Arch. Hydrobiol. Suppl.* 24 1957 : 153-185 2 pls. 36 figs.

Tsukahara, S. *see* Kubo, I.

Tsukamoto, Y. & Yoshino, S. (1). A study of the lateral-line system in fish. I. Quantitative analysis of fiber calibres in the lateral-line nerves of fishes. *Jap. J. Ichth.* 6 1957 : 59-64.

Tsukamoto, Y. & Yoshino, S. (2). A study of the lateral-line system in fish. II. On the relation between the function of the lateral-line organ and the habits of fish. *Jap. J. Ichth.* 6 1957 : 131-135.

Tsukamoto, Y. *see* Suyehiro, Y.

Tsukuda, H. & Katayama, T. Temperature adaptation in fishes. I. The influences of rearing temperature on the temperature tolerance, growth rate and body form. *Physiol. & Ecol.*, Kyoto 7 1957: 113-122 1 pl. 4 figs. [English summary.]

Tsuyuki, H. *see* Idler, D. R.

Tucker, D. W. (1). Proposed use of the plenary powers to suppress the generic name *Acinacea* Bory de St. Vincent, 1804, and the specific name *notha* Bory de St. Vincent, 1804, as published in the combination *Acinacea notha*, for the purpose of making the generic name *Gempylus* Cuvier, 1829, and the name *serpens*, Cuvier, 1829, as published in the combination *Gempylus serpens*, the oldest available names for the genus and species concerned. *Bull. zool. Nom.* 11 1955: 285-288.

Tucker, D. W. (2). Supplementary note on the breeding of the blue shark *Prionace glauca* (L.). *Ann. Mag. nat. Hist.* (13) 1: 315-316.

Tucker, D. W. & Newnham, C. T. The blue shark *Prionace glauca* (L.) breeds in British seas. *Ann. Mag. nat. Hist.* (12) 10 1957 (1958): 673-688 4 figs. 2 pls.

Tuggac, M. On the biology of the *Scomber colias* Gmelin. *Proc. Fish. Counc. Mediterr. F.A.O.* 4 1957: 145-159 20 figs.

Twomey, E. Salmon of the River Shannon (1952-1956). *J. Cons. int. Explor. Mer* 23 1957: 89-96 4 figs.

Tzentilovich, F. F. *see* Nikolski, G. V.

Uchida, I. *see* Hirotsaki, Y.

Uchida, K. & Shojima, Y. Studies on the larvae and juveniles of fishes accompanying floating algae I. Research in the vicinity of Tsuyazaki, during Mar. 1957-Mar. 1958. *Bull. jap. Soc. sci. Fish.* 24: 411-415. [Japanese with English summary.]

Uchida, K. & others. The spawning and early life history of "Buri", Japanese yellow tail, *Seriola quinqueradiata* Temminck et Schlegel. *Sci. Bull. Fac. Agric. Kyushu Univ.* 16: 329-342 2 pls. 2 figs. [English summary.]

Uda, M. A consideration on the long years trend of the fisheries fluctuation in relation to sea conditions. *Bull. jap. Soc. sci. Fish.* 23 1957: 368-372.

Uematsue, T. *see* Ono, Y.

Underhill, J. C. The distribution of Minnesota minnows and darters in relation to Pleistocene glaciation. *Occ. Pap. Minnesota Mus. nat. Hist.* No. 7 1957: 1-45 29 maps.

Uno, Y. *see* Suyama, M.

Ussoltsev, E. A. *see* Bukirev, A. I.

Vaas, K. F. & Sachlan, M. Cultivation of common carp in running water in West Java. *Proc. Indo-Pacif. Fish. Counc. 6th Session 1955 [1956]*: 187-196.

Vallentyne, J. R. *see* Lagler, K. F.

Vangerow, E. F. Mikropaläontologische Untersuchungen in den Kohlscheider Schichten im Wurmrenvier bei Aachen. *Geol. Jb.* 73: 457-506 5 pls.

Van Oosten, J. & Eschmeyer, P. H. Biology of young lake trout (*Salvelinus namaycush*) in Lake Michigan. *Res. Rep. U.S. Fish. Surv.* No. 42 1956: 1-88.

Varenika, D. *see* Rukavina, J.

Varičak, T. Das Epigonalorgan der Selachier, seine Struktur und Bedeutung. *Bull. int. Acad. yougosl. Sci. N.S.* No. 14 1955: 35-48 3 pls. 25 figs.

Vásárhelyi, I. Beiträge zur Bestimmung der Karpfenartigen mit Hilfe der Schlundknochen. *Arch. Fisch. Wiss.* 9: 187-199 32 figs.

Vashchenko, D. M. The carp as the object of pike feeding in Kakhova Water Reservoir in the first year of its formation. *Zool. Zh.* 37: 1745-1748. [Russian with English summary.]

Vasiliu-Suceveanu, N. *see* Radulescu, I.

Vasisht, H. S. Fish spermatogenesis with particular reference to the fate of the cytoplasmic inclusions. IV. Spermatogenesis of *Ophiocephalus punctatus*. *Res. Bull. Panjab Univ. (Zool.)* No. 126 1957: 443-446 1 pl.

Vasnetzov, V. V. The growth rate in fishes as adaptation. *Bull. Soc. nat. Moscou. Sect. Biol.* N.S. 52 No. 1 1947: 23-34. [Russian with English summary.]

- Vassady, N. *see* Oppenheimer, J. M.
- Veit, K. Einige Beobachtungen über die ersten Furchungsschritte bei *Petromyzon planeri*. Gegenbaurs Jb. 98 1957: 1-34 16 figs.
- Vejmola, L. Über die Zusammensetzung der Nahrung des Näsblings (*Chondrostoma nasus* L.) im Flusse Moravice. Acta Univ. Agr. Silo. Brno. Rada A. Spisy Fak. Agron. a Zost. 1957 1957: 357-374 3 figs. [Russian & German summaries.]
- Vendrely, R. *see* Knobloch, A.
- Venkatasamy, A. D. *see* Krishna-murthi, B.
- (Verigin, B. V.). [Structure of the gill apparatus and the suprabranchial organ of *Hypophthalmichthys molitrix*.] Zool. Zh. 36 1957: 595-602 9 figs. [In Russian with English summary.]
- Viaud, G. & Dreyfus, E. Le galvanotropisme du poisson *Carassius vulgaris* Nilsson. C.R. Soc. Biol. Paris 151: 1590-1593 2 figs.
- Vibert, R. Critères et tests de rusticité chez les truites et des saumons. Verh. int. Ver. Limnol. 13: 758-764 1 fig.
- Vincent, A. *see* Furnestin, J.
- Vishniac, H. S. & Nigrelli, R. F. The ability of the Saprolegniaceae to parasitize Platyfish. Zoologica, N.Y. 42 1957: 131-134 1 pl.
- (Vladimirskaya, M. I.). [Grayling from the lakes of the north-western area of the lake Imandra basin.] Zool. Zh. 36 1957: 729-736 2 figs. [In Russian with English summary.]
- Vladykov, V. D. Fish tags and tagging in Quebec waters. Trans. Amer. Fish. Soc. 86 (1956) 1957: 345-349.
- Vladykov, V. D. & Beaulieu, G. Variations dans le Québec de l'abondance annuelle des poissons originaires des grands-lacs. Nat. Canad. 85: 149-156 3 figs.
- Vladykov, V. D. & Follett, W. I. Redescription of *Lampetra ayresii* (Günther) of Western North America, a species of lamprey (Petromyzontidae) district from *Lampetra fluviatilis* (Linnaeus) of Europe. J. Fish. Res. Bd. Can. 15: 47-77.
- Volpe, A. V. Fingerprinting fish. Bull. int. oceanogr. Fdn 2 1956: 134-142 figs.
- Vorbrodt, K. Histochemical changes in the muscles of sea-trout embryos (*Salmo trutta* L.) caused by a temperature of + 30° C. Folia biol., Kraków 5 1957: 175-193 5 figs. [English summary.]
- Voss, G. L. *see* McKenney, T. W.
- Vucetic, T. Some observations on the ecology of the spawning of anchovy (*Engraulis encrasicolus* L.) in the lakes of Mljet Island. Proc. Fish. Council. Mediterr. F.A.O. 4 1957: 227-233 1 fig.
- Wager, V. A. The Lung fish. Afr. wild Life 12: 151-154 2 figs.
- Wajdowicz, Z. (1). Das Staubecken von Goczałkowice als Fischerei-Objekt. Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 6: 109-120 4 figs. [Polish with German summary.]
- Wajdowicz, Z. (2). Das Staubecken von Goczałkowice als Fischerei-Objekt. II. Teil, Die Gestaltung des Fischbestandes im Anfangsstadium des Staubeckens. Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 7: 67-86. [German summary.]
- Walaszek, E. J. & Abood, L. G. Effect of tranquilizing drugs on fighting response of Siamese fighting fish. Science 124 1956: 440-441.
- Walburg, C. H. Relative abundance of Maryland shad, 1944-1952. Res. Rep. U.S. Fish. Serv. No. 38 1955: 1-17 4 figs.
- Wald, G., Brown, P. K. & P. S. Visual pigments and depths of habitat of marine fishes. Nature, Lond. 180 1957: 969-971 3 figs.
- Waldron, K. D. *see* Yamashita, D. T.
- Wales, J. H. Intestinal flukes as a possible cause of mortality in wild trout. Calif. Fish Game 44: 350-352.
- Wallbrunn, H. M. Genetics of the Siamese fighting fish, *Betta splendens*. Genetics 43: 289-298.
- Walrecht, J. J. R. Invasie van de makrealgeep of Walcheren. Levende Nat. 61: 32-34 1 fig.
- Walvig, F. Blood and parenchymal cells in the spleen of the icefish *Chaenoccephalus aceratus* (Lönnb rg). Nytt Mag. Zool. 6: 111-119 2 pls.

Wang, Y. & Li, M. Observations on abnormal brains in the dogfish (*Mustelus manazo* Bleeker). Acta zool. Sinica 9 1957 : 277-281 1 pl.

Warner, A. M. see Russell, F. E.

Warren, A. A. see Ogilvie, J. M. G.

Watanabe, T. see Hattori, S.

Waterman, T. H. Polarization of scattered sunlight in deep water. Deep Sea Res. 3 (Suppl.) 1955 : 426-434.

Waterman, T. H. & Westell, W. E. Quantitative effect of the sun's position on submarine light polarization. J. Mar. Res. 15 1956 : 149-169 12 figs.

Watson, N. H. F. see Lawler, G. H.

Wattison, A. Note on the occurrence of *Holoptychius nobilissimus* Ag. in Dura Den, Fife. Trans. Edinb. geol. Soc. 17 : 179.

Watts, J. C. D. (1). The chemical composition of West African fish. 1. The West African shad, *Ethmalosa dorsalis* (C. & V.) from the Sierra Leone River estuary. Bull. Inst. franç. Afr. noire 19A 1957 : 539-547 3 figs.

Watts, J. C. D. (2). The saw fish of Sierra Leone. Nature, Lond. 182 : 961-962.

Waynarovich, E. Ein Gerät zur quantitativen Prüfung des Mageninhaltes von Raubfischen. Z. Fisch. 7 N.F. : 549-553 5 figs.

Weatherley, A. H. (1). Growth, production, and survival of brown trout in a large farm dam. Aust. J. mar. freshw. Res. 9 : 159-166 2 figs.

Weatherley, A. H. (2). Tasmanian Farm dams in relation to fish culture. Tech. Pap. Div. Fish. Aust. No. 4 : 1-24 12 figs.

Webbe, —. The action on fish of several chlorinated hydrocarbons when used as larvicides. Ann. Trop. Med. Parasit. 51 No. 3 1957 : ?

Wedin, B. The origin and development of the extrinsic ocular muscles in *Torpedo ocellata*. J. Morph. 97 1955 : 473-495 10 figs.

Weiler, W. (1). Fisch-Otolithen aus dem Oberolegozän und dem Mittelmiozän der Niederrheinischen Bucht. Fortschr. Geol. Rhein. Westfalen 1-2 : 323-361 3 pls. figs.

Weiler, W. (2). Fischreste, insbesondere Otolithen. In Freund, H. Handbuch der Mikroskopie in der Technik. Band II, Teil 3 : 265-280 figs. Frankfurt-am-Main.

Weingarten, M. Pflege und Zucht meiner *Symphysodon discus*. Aquar. Terrar. Z. 11 : 129-135 4 figs and colour-photo.

Weinreb, E. L. Studies on the histology and histopathology of the rainbow trout, *Salmo gairdneri irideus*. I. Hematology: Under normal and experimental conditions of inflammation. Zoologica, N.Y. 43 : 145-154 1 pl.

Weisel, G. F. The osteology of *Mylocheilus caurinum* × *Ptychocheilus oregonense*, a cyprinid hybrid, compared with its parental species. J. Morph. 96 1956 : 333-357 47 figs.

Weisz, T. see Kux, Z.

Weitzman, S. (1). The flying characins. Aquar. J. 28 1957 : 275-283 6 figs.

Weitzman, S. (2). Die "fliegenden Salmier." Aquar. Terrar. Z. 11 : 42-45 8 figs.

Wellensiek, U. Die Allometriebeziehungen und Konstruktionsänderungen bei dem kleinsten Fisch im Vergleich mit etwas grosseren verwandten Formen. Zool. Jb. (Anat.) 73 1953 : 187-228 8 figs.

Went, A. E. J. (1). Irish salmon and salmon fisheries being the Buckland Lectures for 1953, London, (Edward Arnold) 1955 pp. v + 93 21 figs.

Went, A. E. J. (2). Salmon movements around Ireland. VIII. From drift nets along the coast of County Donegal (1953-1957). Proc. roy. Irish Acad. 59B : 205-212 2 figs.

Westell, W. E. see Waterman, T. H.

Westoll, T. S. (1). The origin of Continental vertebrate faunas. Trans. geol. Soc. Glasg. 23 : 79-105 figs.

Westoll, T. S. (2). The lateral fin-fold theory and the pectoral fins of Ostracoderms and early fishes. In Studies on fossil vertebrates, London : 180-211 5 figs.

Wharton, J. C. F. A preliminary report on new techniques for the artificial fertilization of trout ova. Fish. Contr. Vict. No. 6 1957 : 1-9 3 pls.

Wheatland, S. B. Oceanography of Long Island Sound, 1952-54. VII. Pelagic fish eggs and larvae. Bull. Bingham oceanogr. Coll. **15** 1956 : 234-314 2 figs.

Wheeler, A. C. (1). The Gronovius fish collection: a catalogue and historical account. Bull. Brit. Mus. (nat. Hist.) Hist. Ser. **1** : 187-249 9 pls.

Wheeler, A. C. (2). The fishes of the London area. Lond. Nat. No. 37 [1958] : 80-101.

Wheeler, A. C. (3). The identity of the British fish *Parviclinus spinosus*. Proc. zool. Soc. Lond., **130** : 253-256 1 pl.

Wheeler, A. C. *see* Harding, J. P.

Wheeler, A. C. *see* Palmer, G.

White, E. I. (1). On *Cephalaspis lyelli* Agassiz. Palaeontology **1** : 99-105 2 pls. figs.

White, E. I. (2). Original environment of Craniates. In "Studies in Fossil Vertebrates" London : 212-234 8 text-figs.

Whitehead, P. J. (1). A new species of *Chiloglanis* (Pisces, Mochocidae) in Kenya. Ann. Mag. nat. Hist. (13) **1** : 197-208 4 figs.

Whitehead, P. J. (2). Indigenous river fishing methods in Kenya. E. Afr. Agric. J. **24** : 111-120 7 pls. 1 fig.

Whitesel, L. E. *see* Clutter, R. I.

Whitley, G. P. (1). New fish names. Proc. roy. zool. Soc. N.S.W. **1948-49** 1950 : 44.

Whitley, G. P. (2). Descriptions and records of fishes. Proc. R. zool. Soc. N.S.W. **1956-57** : 28-51 12 figs.

Whitley, G. P. (3). A new gudgeon from the New Hebrides. Proc. R. zool. Soc. N.S.W. **1956-57** : 85-87 1 fig.

Whitley, G. P. (4). Fishes from inland New Guinea. Rec. Aust. Mus. **24** 1957 : 23-30 1 pl. 1 fig. map.

Whitley, G. P. (5). A new angler fish. W. Aust. Nat. **5** 1957 : 207-209 1 fig.

Whitley, G. P. (6). Freshwater sunfish from western New South Wales. Aust. Nat. **11** 1957 : 230-231 1 fig.

Whitley, G. P. (7). A kennel of frog-fishes. Aust. Mus. Mag. **12** 1957 : 139-142 figs.

Whitley, G. P. (8). The moonfish or opah in New South Wales. Aust. Mus. Mag. **12** : 278.

Whitley, G. P. (9). New Guinea's fishes. Aust. Mus. Mag. **12** : 398-401 3 figs.

Wiborg, K. F. Factors influencing the size of the year classes in the Arcto-Norwegian tribe of cod. Fiskeridir. Skr. Havundersøk. **11** No. 8 1957 : 1-24 6 figs.

Wickett, W. P. Review of certain environmental factors affecting the production of pink and chum salmon. J. Fish. Res. Bd. Can. **15** 1103-1126 8 figs.

Wickett, W. P. *see* Alderdice, D. F.

Wickler, W. (1). Das Verhalten von *Nannostomus beckfordi aripiragensis* Meinken. Mit einer Besprechung der Schwimmblasenfunktion. Beaufortia **6** 1957 : 203-220.

Wickler, W. (2). Das Verhalten von *Xiphophorus maculatus* var. Wagtail und verwandten Arten. Z. Tierpsychol. **14** 1957 : 324-346 21 figs.

Wickler, W. (3). Vergleichende Verhaltensstudien an Grundfischen. I. Beiträge zur Biologie, besonders zur Ethologie von *Blennius fluviatilis* Asso im Vergleich zu einigen anderen Bodenfischen. Z. Tierpsychol. **14** 1957 : 393-428 21 figs.

Wickler, W. (4). Vergleichende Verhaltensstudien an Grundfischen. II. Die Spezialisierung des *Steatocranus*. Z. Tierpsychol. **15** : 427-446 16 figs.

Wickler, W. (5). Über einige indische Schmerlen. Aquar. Terrar. Z. **11** : 261-262 1 text-fig.

Wickler, W. (6). Haftvorrichtungen an Fischeiern und Fischlarven. Mikrokosmos **47** 1957 : 9-12 4 figs.

Wielinga, D. T. Deductive investigations on the nature and origin of relations between biological characters (A biodynamic study on herring). Groningen Univ. : 1-172, 26 figs. tabs. [English summary.]

Wiktor, J. The fluctuation of perch-pike catches in the Firth of Szczecin in 1950-1954 and their biological causes. Prace morsk. Inst. ryback. No. **9** 1957 : 259-296 13 figs. [In Polish, English summary.]

Wilbert, J. La pesca en la montaña. Mem. Soc. Cienc. nat. La Salle 16 1956 : 99-124 6 figs. map.

Wilhelm, O. E. & Hulot, A. L. Pesca y peces di la Isla de Pascua. (Notas ictiológicas de Chile.) Bol. Soc. Biol. Concepcion 32 1957 : 139-152 4 figs.

Williams, F. Fishes of the family Carangidae in British East African waters. Ann. Mag. nat. Hist. (13) 1 : 369-430 16 pls.

Williams, G. C. Homing behaviour of California rocky shore fishes. Univ. Calif. Publ. Zool. 59 1957 : 249-284 1 fig.

Wilson, D. P. Notes from the Plymouth Aquarium. III. J. mar. Biol. Ass. U.K. 37 : 299-307 2 pls.

Wilson, W. B. see Ray, S. M.

Winks, B. see Martin, M.

Winn, H. E. (1). Observations on the reproductive habits of darters (Pisces-Percidae). Amer. midl. Nat. 59 : 190-212.

Winn, H. E. (2). Comparative reproductive behaviour and ecology of fourteen species of darters (Pisces-Percidae). Ecol. Monogr. 28 : 155-191 7 figs.

Winn, H. E. & Bardach, J. E. Behaviour, sexual dichromatism, and species of parrot fishes. Science 125 1957 : 885-886.

Wise, J. P. (1). Growth rate of Brown's bank haddock. Res. Rep. U.S. Fish. Serv. No. 50 1957 : 1-13 4 figs.

Wise, J. P. (2). The world's southernmost indigenous cod. J. Cons. int. Explor. Mer 23 : 208-212 1 fig.

Wisner, R. L. Is the spear of istio-phorid fishes used in feeding? Pacif. Sci. 12 : 60-70 3 figs.

Wittenberg, J. B. The secretion of inert gas into the swim-bladder of fish. J. Gen. Physiol. 41 : 783-804 5 figs.

Wolf, K. & Dunbar, C. E. Cultivation of adult teleost tissues 'in vitro.' Proc. Soc. exp. Biol. Med. 95 1957 : 455-458 2 figs.

Wood, F. G. see Gilbert, P. W.

Wood, H. see Bückmann, A.

Wood, J. D. Nitrogen excretion in some marine teleosts. Canad. J. Biochem. & Phys. 36 : 1237-1241 [see also Stud. Fish. Res. Bd. Can. No. 542.]

Woodhead, P. N. J. & A. D. An effect of low temperature on the osmoregulatory ability of the cod (*Gadus callarias*) in Arctic Waters. Proc. Linn. Soc. Lond. no. 169: 63-64.

Woods, L. P. A new genus and species of fish from the Gulf of Mexico. (Family Emmelichthyidae). Fieldiana Zool. 39 : 249-252 1 fig.

Woods, L. P. & Inger, R. F. The cave, spring and swamp fishes of the family Amblyopsidae of Central and Eastern United States. Amer. Midl. Nat. 58 1957 : 232-256 11 figs.

Woolcott, M. S. see Burke, J. D.

Woolcott, W. S. see Raney, E. C.

Wright, P. G. An electrical receptor in fishes. Nature, Lond. 181 : 64-65 1 fig.

Wu, H.-W. & Jao, C.-C. Fish farming in the shallow lakes in China. Verh. int. Ver. Limnol. 13 : 765-769.

Wunder, W. (1). Das Verhalten von Hoden, Niere und Leber nach Entfernung von Teilstücken beim Karpfen. (*Cyprinus carpio* L.). Zool. Anz. 155 1955 : 232-239 7 figs.

Wunder, W. (2). Ungewöhnliche Veränderungen an der Wirbelsäule des Karpfens, ihre Einwirkung auf Körperform und Wachstum der Fische. Zool. Anz. 158 1957 : 1-11 8 figs.

Wunder, W. (3). Biologie und Bau der Netzhaut beim Rotbarsch (*Sebastes marinus* L.). Zool. Anz. 160 : 94-105 4 figs.

Wunder, W. (4). Über die Lage der Organe beim trommelsüchtigen Rotbarsch (*Sebastes marinus* L.). Zool. Anz. 160 : 169-172 2 figs.

Yamabayashi, I. see Kobayashi, H.

Yamada, J. (1). On the mechanism of the appearance of the scale structure. V. The possible role of alkaline phosphates in the formation of the teleost scale. Bull. Fac. Fish. Hokkaido 7 1956 : 185-201 3 pls.

Yamada, J. (2). On the mechanism of the appearance of the scale structure. VI. Some observations associating with the absorption of scale in the goldfish. Bull. Fac. Fish. Hokkaido 7 1956 : 202-207 5 figs.

Yamada, J. see Hirao, S.

- Yamamoto, K. (1).** Studies on the formation of fish eggs. IX. The fate of the yolk vesicle in the oocyte of the flounder *Liopsetta obscura* during vitellogenesis. XII. On the non-massed yolk in the egg of the herring, *Clupea pallasii*. Bull. Fac. Fish. Hokkaido 7 1956 : 208-212 1 pl.; 8 : 270-277.
- Yamamoto, K. (2).** Studies on the formation of fish eggs. XI. The formation of a continuous mass of yolk and the chemical nature of lipids contained in it in the oocyte of the flounder, *Liopsetta obscura*. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 344-351 10 figs.
- Yamamoto, T. S. (1).** Estrone-induced intersex of genetic male in the Medaka, *Oryzias latipes*. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 440-444 2 figs.
- Yamamoto, T. S. (2).** Some morphological and physiological aspects of the eggs of teleostean fishes. J. Fac. Sci. Hokkaido Univ. (Zool.) 13 1957 : 484-488.
- Yamamoto, T. S. (3).** Some experiments in the chemical changes in the membrane of salmon eggs occurring at the time of activation. Jap. J. Ichth. 6 1957 : 54-58.
- Yamamoto, T. S. (4).** Artificial induction of functional sex-reversal in genotypic females of the medaka (*Oryzias latipes*). J. exp. Zool. 137 : 227-263 17 figs.
- Yamashita, D. T. & Waldron, K. D.** An all-plastic dart-type fish tag. Calif. Fish Game 44 : 311-317 3 figs.
- Yamazaki, G. see Sato, M.**
- Yanagimachi, R. (1).** Some properties of the sperm-activating factor in the micropyle area of the herring-egg. Annot. zool. jap. 30 1957 : 114-119 2 figs.
- Yanagimachi, R. (2).** Studies of fertilization in *Clupea pallasii*. V. The role of calcium ions in fertilization and development. Bull. Jap. Soc. Sci. Fish. 23 1957 : 290-294. [Japanese with English summary.]
- Yanagimachi, R. (3).** Studies of fertilization in *Clupea pallasii*. VI. Fertilization of the egg deprived of the membrane. Jap. J. Ichth. 6 1957 : 1-47 6 figs. [English summary.]
- Yanagimachi, R. (4).** Studies of fertilization in *Clupea pallasii*. VII. On the specific affinity of the micropyle area of the mature egg to some vital dyes. Zool. Mag. Tokyo 67 : 310-314 3 figs. [English summary.]
- Yanase, M.** The vitamin B₆ content of fish liver. Bull. Tokai. Fish. Res. Lab. No. 22 : 53-56. [English summary.]
- Yang, H. Y. see Ping, C.**
- Yasuda, F. & Hiyama, Y.** Mechanism of utilization of plankton by some fishes. Rec. oceanogr. Wks Japan N.S. 3 1957 : 85-91 4 figs.
- Yasuda, F. see Hiyama, Y.**
- Yasuda, H.** Implications of the scale ring. I. The phenomenon of unformed rings on the scales. Bull. jap. Soc. sci. Fish. 24 : 613-615 3 figs. [English summary.]
- Yokote, M. (1).** Morphological notes on the two Chinese carps, *Hypophthalmichthys molitrix* and *Aristichthys nobilis*. Bull. Freshw. Fish. Res. Lab. Tokyo 6 No. 2 1957 : 61-66 4 pls.
- Yokote, M. (2).** Study on the ovarian eggs of *Rhodeus ocellatus*. Bull. Freshw. Fish. Res. Lab. Tokyo 7 (2) : 1-8 2 pls.
- Yonezawa, K.** A study on the three forms of *Sarcocheilichthys variegatus* in Lake Biwa. Jap. J. Ichth. 7 : 19-23 2 pls.
- Yonge, C. Y. see Barrett, J. H.**
- Yoshida, H. O. see Iversen, E. S.**
- Yoshino, S. see Suyehiro, Y.**
- Yoshino, S. see Tsukamoto, Y.**
- Yoshitake, Y. see Kubota, Z.**
- Young, N. see Becker, E. L.**
- (Yudanov, I. G.).** [The results of inspection of spawning places of the Atlantic-Scandinavian herring in 1956.] C.R. Acad. Sci. URSS 119 : 182-184 fig. [In Russian.]
- Yuki, R.** Blood cell constituents in fish. II. Peroxidase staining of leucocytes in the kidney and some other organs. Bull. Fac. Fish. Hokkaido 8 : 264-269.
- Yurovitsky, Y. G.** On the factors determining population density of *Abramis ballerus* L. in the Rybinak Water Reservoir. Zool. Zh. 37 : 1861-1866 [English summary.]

Zahl, P. A. Hatchetfish, torchbearers of the deep. *Nat. geogr. Mag.* **113** : 712-714 5 figs.

Zahnd, J. P. *see* Clavert, J.

(Zalevsky, S. V.). [On the morphological and biological isolation of *Alosa nordmanni* of the Dnepr-Bug firth.] *Zool. Zh.* **37** : 1195-1204 graph. [In Russian with English summary.]

Zama, K. & others. Egg lipids of a salmon, *Oncorhynchus keta*. I. Fatty oils from salmon eggs. *Bull. jap. Soc. sci. Fish.* **24** : 569-572. [Japanese with English summary.]

(Zambriborshch, F. S.). [Structure and function of the suprabranchial organ of *Hypophthalmichthys molitrix* Val.] *Zool. Zh.* **36** 1957 : 587-594 4 figs. [In Russian with English summary.]

Zanandrea, G. (1). Esame critico e comparativo delle Lamprede catturate in Italia. *Arch. zool. (ital.) Napoli* **42** 1957 : 249-305 5 figs. 3 pls.

Zanandrea, G. (2). Le lamprede del Danubio: considerazioni e confronti. *Boll. Pesca Piscic. Idrobiol.* **32** 1956 [1957] : 264-280 1 pl.

Zanandrea, G. (3). Neotenia in *Lampetra planeri zanandreai* (Vladykov) e l'endocrinologia sperimentale dei Ciclostomi. *Boll. Zool.* **23** 1956 [1957] : 413-427 3 pls.

Zanandrea, G. (4). Cenni sulla speciazione delle Lamprede delle regioni oloartiche con particolare riferimento alle somiglianze tra *Lampetra aegyptera* and *Lampetra planeri zanandreai*. *Boll. Zool.* **23** 1956 [1957] : 429-438.

Zanandrea, G. (5). Appunti sulle Lamprede dell'Austria. *Boll. Zool.* **23** 1956 [1957] : 439-447.

Zanandrea, G. (6). Posizione sistematica e distribuzione geografica di *Lampetra zanandreai* Vladykov. *Mem. Mus. civ. Storia nat. Verona* **6** : 207-237 pls. i-iii 3 text-figs.

Zanandrea, G. (7). Catture e allevamenti di lamprede. *Zoo, Milan* (4) **4** No. 4 : 1-8 5 figs.

Żarnecki, S. (1). Über das Zuwachstempo der Nachkommenschaft von zwei Satz Laichkarpfen. *Biul. Zakl. Biol. Staw. Polsk. Nauk No. 6* : 23-34 3 figs. [Polish with German summary.]

Żarnecki, S. (2). The amount of roe obtained by artificial fertilization from the winter form of sea trout (*Salmo trutta* L.) spawning in the affluents of the Upper Vistula. *Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 7* 21-25. [English summary.]

Żarnecki, S. (3). Population of Silesian Vistula trout spawners in 1954. *Polsk. Arch. Hydrobiol.* **4** (17) : 207-220 2 figs. [English summary.]

Żarnecki, S. & Czubak, W. Versuche mit Karpfenvorwüchsen. *Biul. Zakl. Biol. Staw. Polsk. Akad. Nauk No. 4* 1957 : 45-73 14 figs. [Polish with German summary.]

Żarnecki, S. *see* Czubak, W.

Zawisza, J. *see* Backiel, T.

Zbyszewski, G. Le Burdigalien de Lisbonne. *Comun. Serv. geol. Portug.* **38** 1 1957 : 91-226 19 pls. (Pisces p. 189).

(Zhabelleva, A. V.). [Feeding of cod in the coastal zone of the Eastern Murman.] *Trud. Murman biol. Sta.* **3** 1957 : 140-145 4 figs. [In Russian.]

(Zhukan, P. I.) [Fishes of the river Neman in Belorussia.] *Izv. Akad. Nauk Beloruss. SSR* **1** 1956 : 97-107. (Russian summary.)

(Zhukov, P. I.) [Fish fauna of the river Neman basin.] *Izv. Akad. Nauk Beloruss. SSR Biol.* **3** 1956 : 75-82. [In Belorussian.]

(Zhukova, A. I.) [Importance of microorganisms as basic fish food.] *Vop. Ikhtiol.* **9** 1957 : 152-168 5 figs. [In Russian.]

(Zhukovski, G. M.) [Spawning migrations and the spawning grounds of *Vimba vimba natio carinata* in Don.] *Vop. Ikhtiol.* **9** 1957 : 78-90. [In Russian.]

Ziemiankowski, V. *see* Popescu, E.

Zijlstra, J. J. *see* Bückmann, A.

Zinziro, N. Fluctuations in the fishery for young sardine off Shichiri-Mihama, Kii Peninsula. *Rec. oceanogr. Wks Japan. Spec. no. 2* : 128-144 4 figs.

Zotin, A. I. The mechanism of hardening of the salmonid egg membrane after fertilization or spontaneous activation. *J. Embryol. exp. Morph.* **6** : 546-568 10 figs.

Zukowski, C. Investigations on the cod in the southern part of the Bornholm Basin in the years 1951-1952. *Prace morsk. Inst. ryback.* No. 9 1957: 45-78 19 figs. [In Polish; English summary.]

II.—SUBJECT INDEX

GENERAL

Text-books.—**Berg** (2); general zoology, **Guthrie & Anderson**; **Grassé & others**; Marine ecology, **Moore, H. B.**; morphological integration with particular regard to palaeozoology, **Olson & Miller**; origin, anatomy and function of the vertebrate visual system, **Polyak**.

Popular books.—Fishes for a marine aquarium, **Simkatis**.

Biography and bibliography.—Obituary of **S. L. Hora**, **Anon** (2); **Roonwal**; recent works on Mediterranean fishes, **Dieuzeide** (1).

Historical.—Domestication and varieties of *Carassius*, **Chen**; *Salmo* in Irish history, **Went** (1); some Cyprinid types of Cuvier and Valenciennes, **Guibé & Spillmann**; account of Gronovius fish collection, **Wheeler** (1); fishes used in philately, **Houdemer**; fishes of Indiana, **Gerking**; fish in Jataka sculptures, **Hora** (2); fish in Jataka tales, **Hora & Saraswati**; fish paintings of the Third Millennium, **Hora** (3).

Expeditions and collections.—Location of types originally in New York Zool. Soc. collections, **Mead** (3); fishes in Rio de Janeiro Museum, **Miranda Ribeiro**; teleosts in the collection of the Institut scientifique chérifien, **Rabat**, **Dollfus** (3); West African fishes in Genoa museum, **Tortonese & Arbocco**; Scheuchzers collection, **Regteren Altena**.

Techniques.—Method of anesthetizing large elasmobranchs, **Gilbert & Wood**; measuring embryos and young fishes, **Gühr**; projector for measuring fish scales, **Hartley** (2); identification using scales, **Essex & Shelton**; apparatus for study of locomotion, **Bainbridge & Brown**; method of recording fish activity, **Adams**; methods of studying fish vision, **Protasov** (2); method of studying isolated electrophox of *Raja*, **Schoffeniels** (1); 'window' technique for observing fish viscera *in vivo*, **Burnstock**; use of gastric sucker for

examining stomach contents, **Woy-narovich**; methods of studying vascular system, **Gastaud** (1); blood removal from fishes, **Boroughts & Reid**; method of keeping isolated heart beating, **Cortot & Rybak**; cultivation of teleost tissues 'in vitro', **Wolf & Dunbar**; method for determination of oxygen consumption in ova and young Salmonidae, **Spass**; fixation of radioactive phosphor in the epiphysis of *Salmo gairdnerii*, **Palayer**; method for controlling spawning and collection of eggs of *Brachydanio*, **Legault**; apparatus for rearing young fishes, **Swarup** (3); method of rearing germ free fish, **Shaw**; experimental fish trapping and keeping fish in cages in a stream, **Allan & others**; efficacy of methods of marking, **Oliva** (1); fish-marking, **O'Rourke & Makings**; **Volpe**; new type of dart fishtag, **Yamashita & Waldron**; use of drop-net quadrat for population sampling, **Hellier**; direct current electrofishing apparatus, **Murray** (2); method of casting in plaster, **Mackay**.

ECONOMICS

Fisheries research.—Review, **Büsk-mann**; biological review of freshwater fisheries, **Le Cren** (3); investigations in Lake Balkhash, Russia, **Savina & Pokrovski**.

Fishery resources.—Using fishery resources of L. Victoria, **Beauchamp**; fisheries development in the colonial territories, **Hickling**.

Conservation.—Of inland fisheries, **Hoistede**; improvement of fish fauna of the White Sea, **Palenichko**.

Effects on fishes of industrial effluents.—Investigation of fishes in a sewage effluent, **Allan & others**; effect of industrial wastes on fishes of Kama river, **Gromov**; possible effect of tannic acid on gonadotropic hormones, **Zanandrea** (3).

Dams and other obstructions affecting fisheries.—Guiding migrant *Oncorhynchus* at dams, **Andrew & others**; effect of Baker Dam on migrant *Oncorhynchus*, **Hamilton & Andrew**; effect of Kakhovka dam on spawning of *Pelecus*, **Bugai**; effect of Goczalkowice dam, Poland, on fishes, **Wajdowicz** (2); effect of Sind barrage on *Hilsa*, **Quareshi**; salmon research in relation to hydro-electric power development, **Brett** (1).

Pisciculture and fish management.—Fish farming in Russia, **Movchan** (1) & (2); **Berdichevski**; in Ukraine, **Movchan** (3); in China, **Wu & Jao**; in East Germany, **Bauer, O. N.** (1); in the Danube delta, **Rodewald-Rudescu**; Carp farming in Kirgizia, **Goncharov**; fishery of Goczalkowice reservoir, Poland, **Wajdowicz** (1); farm dams in relation to fish culture in Tasmania, **Weatherley** (2); culture of *Coregonus*, **Bernatowicz**; **Bauch** (2); of *Cyprinus* in Java, **Vaas & Sachlan**; of *Tilapia*, **Chimits**; of *Mugil* in Israel carp ponds, **Perlmutter & others**; harvesting of *Micropterus*, **Hulse & Miller**; raising carp fingerling, **Nakamura, K. & others** (3); method of raising *Menidia* fry in laboratory, **Rubinoff**; spawning wild *Carassius*, **Matsushima**; breeding *Acipenser*, **Gerbilski** (2); breeding *Pelecus* in slow running waters, **Poddubny**; breeding *Anguilla* in carp ponds, **Kokhnenko**; reproduction of *Misgurnus*, **Kubota, Z. & others**; method of improving artificial insemination in *Salmo*, **Inaba & others** (2); new method of artificial fertilization of *Salmo* ova, **Wharton**; artificial and natural propagation of *Oncorhynchus kisutch*, **Salo & Bayliff**; artificial spawning of *Thymallus*, **Svetina**; results of artificial reproduction of *Leuciscus idus*, **Popescu, E. & others**; effect of salinity on carp spawning **Friedland**; use of hormones to induce spawning, **Chaudhuri & Alikunhi**; growth and reproduction of fishes in Iowa ponds, **Moorman**; growth of carp from differently managed ponds, **Czubak & Zarnecki**; establishment and feeding of *Clupea* in aquaria, **Parrish & others**; **Blaxter & Holliday**; feeding of young *Salmo*, **Čatić**; feeding experiments with young *Pneumatophorus*, **Takahashi & Hatanaka**; artificial feeding and growth of *Mugil*, **Marocco**; experiments on fry with different foods, **Eguchi & Kai**; **Kai & Eguchi**; microorganisms as source of vitamins in food of fry, **Assman** (1); importance of microorganisms as fish food, **Zhukova**; protein value of some hatchery diets, **Ogino**; relation between phytoplankton photosynthesis and growth of *Oncorhynchus*, **Nelson**; factors affecting pond balance and productivity, **Morgan**; relative abundance of *Alosa* population, **Walburg**; management of Salmonids in Lake Garda, **Merlo** (2); reasons for high mortality of trout after release into

open water, **Miller, R. B.**; relation between trout survival and available food, **Reimers** (1); production and survival of *Salmo*, **Weatherley** (1); survival of *Salmo* in trout stream, **Nicholls** (3); assessing survival rate of *Salmo*, **Vibert**; survival rate of British Columbia *Salmo*, **Godfrey** (3); survival rate of fingerling *Salmo*, **Onodera**; production of *Salmo* smolts, **Elson** (2); maintenance of *Salmo* stock, **Elson** (3); use of hatcheries in assuring stocks of *Salmo salar*, **Elson** (4); mortality of hatchery reared eggs of *Oncorhynchus*, **Allen**; guiding young *Oncorhynchus*, **Brett & Alderdice** (1); management of Rivers Inlet *Oncorhynchus*, **Foskett**; role of Coleman Hatchery in maintaining *Oncorhynchus* stock, **Cope & Slater**; environmental factors affecting *Oncorhynchus* stocks, **Wickett**; carp fingerling production in Japan, **Nakamura, K. & others** (2); methods of improving *Cyprinus* stock in L. Balkhash, **Serov** (1); stocking results of *Plecoglossus*, **Shimadzu**; production of *Tilapia mossambica* in Thailand, **Pongsuwana**; management of *Mugil* stocks in Caspian and Black Seas, **Babayan**; experiment on fish production, **Backiel & others**; productivity of a German lake, **Rahn**; productivity in Nagano Pref., Japan, **Nakamura, K. & others** (1); two-way netting fence for counting *Salmo*, **Blair**; use of seining for estimation of population changes, **Paloumpis** (2); control of *Serrasalmus* in a reservoir, **Paiva**; effects of wild fish entering fish ponds, **Ivasik**; predation by *Esox* on young *Cyprinus*, **Vashchenko**; temperature requirements for transporting fishes, **Suntur**; biochemical buffer for use in fish transport, **McFarland & Norris**; flotation of fishes following electrical shock, **Lewis, W. H. & Charles**; chemical control of coarse fish, **Pintler & Johnson**; selective poison for eliminating small fish, **Fukano & Hooper**; non-injurious effect of 2-4D weed killer on fishes, **Sen**; effect of DDT spraying on salmon runs, **Kerswill**; use of chemicals as *Petromyzon* larvicide, **Applegate & others**; stunting and recovery of *Ictalurus*, **Tiemeier**; skeletal anomalies in *Cyprinus* and their cause, **Müller, G.**

Fishes useful or harmful to man.—Edible fishes of the Antilles, **Morice**; two fatalities from *Urolophus* wounds, **Russell & others** (2); shark attacks,

Cadenat (4); shark attacks in S. Africa, Smith, J. L. B. (13) & (15).

Poisonous and venomous fishes.—Some poisonous Australian fishes, Butcher; food poisoning from *Decap-terus*, Kawabata & others; food poisoning from *Gymnothorax*, Ralls & Halstead; poisoning by *Pterois*, Ray & Coates; poisoning from Mauritius fishes, Jones, J. D.; toxin in eggs of *Fugu*, Suyama & Uno; effects of toxins, Banner & Boroughs; ciguatera fish-poisoning, Randall (1); cardiovascular effects of *Urolophus* venom, Russell & others (1); properties of *Urolophus* and *Myliobatis* venom, Russell, F. E. & others (3).

Fishes used as test animals.—Fish tissues and virus diseases, Grützner (1) & (2); *Brachydanio* embryos used as bio-assay material, Jones, R. W. & Huffman.

Fishing methods and gear.—Taliev; electrical fishing, Idyll; methods used in Kenya, Whitehead (2); in Macedonia, Apostolski; in Venezuela, Mendez & Martin; in S. America, Wilbert; in Ceylon, de Zylva; stilt fishers of Ceylon coast (photo.), Kessel; use of 'Dol' net in Indian waters, Gokhale; use of the 'Marala' sink net, Mohapatra; tuna fishing in Turkish waters, Iyigüngör.

Fisheries of.—Italy (coastal), Russo; Basque coast (tunny), Tourrasse; Israel (pelagic), Ben-Tuvia; Israel (marine), Cohen, S. B.; Murren, Sonina; East Bengal (*Hilsa*), Ahmad (2); Uttar Pradesh (*Hilsa*), Kaushiva; Ceylon, Anon (3); Laccadive Isl., Balan; United States (statistics), Anderson & Power; North America (*Anoplopoma*), Phillips, J. B. (2); Easter Isl., Chile, Wilhelm & Hulot; Tasmanian *Salmo* fishery, Nicholls (1) & (2); Lake Baikal, Taliev.

Oceanography and hydrography.—Oceanography of Long Island Sound, Wheatland; hydrography of Gulf of Iskenderun, Akyüz.

STRUCTURE

General.—Of *Engraulis rissoi*, Senderi; of Cyprinidae, Heuschmann (2); of Cobitidae, Sterba (2); of Gempylids, Matsubara & Iwai (2); of *Barbus*, Dovgan; of *Paradistichodus*, Daget (3); anatomy of *Xiphophorus*, Baker (2); of fossil Agnatha, Stensiö; size of visceral cavity in *Pleuronectes platessa* and *P.*

flesus, Koltzer; adhesive devices in fish eggs and larvae, Wickler (6).

Tegumentary system.—Skin of *Chrysichthys*, Bagrus, *Clarias*, *Synodontis*, Al-Hussaini & Luffy; "hairs" of *Mirapinna*, Halstead & others; scale arrangement in fishes, Kobayasi, H. & Hayasi teleost scale structure, Yamada (1); scales of *Engraulis*, Kondo; scale structure of *Carassius*, Saltö, S.; scales of *Makaira*, La Monte (1); cycloid scales of some Scorpaenoids, Kobayashi, H. (4); scale absorption in *Carassius*, Yamada (2); scale formation after diet deficiency, Yasuda, H.

Fins.—Of *Gambusia*, Franca, P. & M. de L. (3); gonopodial suspensorium of *Lebistes*, Mohsen (1); caudal fin as a hydrofoil, Nursall (2); caudal fin of Ophicephalidae, Hussein; number and position of dorsal fin supports in *Pneumatophorus*, Abe & Takashima; Body-fins and mode of life of earliest vertebrates, Obrucheve (1). lateral fin-fold theory, Westoll (2).

Skeleton.—Of *Arius* spp., Tolentino & Clemente; of *Rita*, Hashmi; of *Esor*, Janec-Suslowska; of *Muraenesox cinereus*, Jang; of *Pomoxis*, Hofstetter & others (2); axial skeleton of *Gambusia*, Franca, P. da & M. de L. (2); of Polynemids, Marathe & Bal (3); skeleton and muscles of *Latimeria*, Millot & Anthony (1); sexual differences in bones of *Oryzias*, Egami & Ishii; osteology of *Mylocheilus caurinus* × *Ptychocheilus oregonense*, Weisel; of Owstoniidae and Cepolidae, Okada & Suzuki (2); of Cottidae and Comephoridae, Taliev; origin and homologues of bones of skull, Devillers; skull and weberian ossicles of Catostomids, Ramaswami; skull of *Arius* and *Plotosus*, Srinivasachar (3); of *Gymnothorax*, Burton; of *Ophicephalus*, Swarup (2); cranium of *Heterotis*, Daget & Aubenton; neurocranium of *Lepidotes*, Beltan (2); chondrocranium in *Myxus* and *Rita*, Srinivasachar (2); functional importance of some morphological characteristics of teleost vertebral column, Hasan; vertebral column of *Psettodes*, Kirtisinghe; lower number of vertebrae associated with higher temperature in *Scardinus*, Müller, G. J.; spiracular cartilage of *Rhinobatus*, Hamdy (1); extravisceral cartilages of *Rhinobatus*, Hamdy (2); opercular bones of *Geophagus* and

Crenicichla, Travassos & Pinto; functional anatomy of jaws and associated structures of *Clupea*, Kirchhoff; oromandibular region of *Hypleurochilus*, Pinto, S. Y. (2); head of *Toxotes*, especially mouth, eye, brain, Lüling (5); pectoral girdle of *Makaira*, Morrow (4).

Dentition.—Osteodentine, Ørvig (1); metaplasia of durodentin, Schmidt, W. J. (1); colour of teeth, Schmidt, W. J. (2); pharyngeal teeth of *Abramis*, Tolg; of some Cyprinids, Cheprakova; fossil teeth and hard tissues, Ørvig (1).

Nervous system.—Relative brain weight in some teleosts, Geiger; choroid plexuses of brain in ganoids and teleosts, Hilton; neuroglia in *Cyprinus* brain, Baginska; subcommissural organ, Olsson (1); *Polypterus*, Olsson (2); neurosecretion in teleost brain, Stahl; brain of a blind fish, Marshall & Thines; abnormal brain structure in *Mustelus*, Wang & Li; spinal cord ganglion cells in *Lampetra*, Johnels (3); gliocytes in spinal cord, Bairati; lateral line nerve fibres, Tsukamoto & Yoshino (1); vagal nerves in *Myxine*, Johnels (2); nerve plexus of digestive tract, Milochin (1) & (2); growth changes in myelin sheath of peripheral nerve fibres, Thomas (1); changes in diameter of peripheral nerve fibres in *Salmo*, Thomas (2); caudal neurosecretory system of *Anguilla*, Enami & Imai (3).

Otoliths, general, Weiler (2); Farkas; formation of annual rings in otoliths, Irie (2); comparative description of sagitta of teleosts, Chaine; of recent and Pliocene fishes of Spain, Bauzá Rullán (1); of fossil and recent fishes, Bauzá Rullán (3); of Teleosts Miocene, Pobedina & others; Miocene-Pliocene of Victoria, Stinton; from Oligocene and Miocene of Rhineland, Weiler (1); ossiculiths from Eocene, Frizzell & Exline; crystal texture of *Pseudosciaena* otoliths, Irie (1).

Sense organs.—Of a blind fish, Marshall & Thines; innervation of membranous labyrinth, Casasco; Weberian ossicles in *Heteropneustes*, Mookerjee & others; auditory organ, Hofstetter & others (1); tongue of fishes, Kapoor (2); distribution of taste buds in some fishes, Bhatti & Islam; barbels of some Indian fishes, Satô & Kapoor; transitory gland like cells in barbel of *Parasilurus*, Satô & Yamazaki; visua

system, Polyak; eye, Lüling (5); retina of *Oncorhynchus*, Brett & Ali; of *Sebastes*, Wunder (3); cell morphology of annular ligament of eye in *Carassius*, Brown, H. D.; optic development in *Astyanax*, Cahn.

Luminous organs.—Of *Myctophum* and *Searsia*, Nicol; of *Opisthoproctus*, Bertelsen (1); of *Siphamia*, Iwai (2); Of *Apogon ellioti*, Iwai & Asano.

Lateral line.—Of *Anoptichthys*, Grobbel & Hahn; disposition of neuromasts in larvae, Thomopoulos; sensory canals of snout in *Elops*, Nybelin (1).

Muscles.—Eye muscles of freshwater teleosts, Stammer; cranial muscles of Clupeoids, Thomas; skeletal musculature of *Cyprinus*, Ping & others; muscles of head and pectoral girdle of *Clarias*, Nawar (1); innervation of muscular tissue of teleost "oreillette," Laurent (1).

Digestive system.—Of *Gadusia*, Kapoor (3); Srivastava (3); of *Chirocentrus*, Srivastava (2); of *Barbus*, Kapoor (1); of *Calla*, Kapoor (4); of young *Ctenopharyngodon* and *Hypophthalmichthys*, Inaba & Nomura; of *Morone*, Sublette; of *Makaira*, La Monte (2); of *Mastacembelus*, Nagar & Khan; innervation of in *Lampetra*, Johnels & Östlund; in *Lucioperca*, Kusminskaya; histophysiology of in *Acipenser*, Krainshkina; variations in digestive tract correlated with feeding habits, Das & Moitra; palatal organ of *Cyprinus*, Jara (1); suprabranchial organ of *Hypophthalmichthys*, Verigin; Zambri-borshch.

Swimbladder.—Of *Argentina*, Fänge; in *Notopteridae*, Dehadrai; of *Anabas*, George; of *Mugilidae*, Srivastava (1); species with and without bladder, Denton & Marshall; drumming muscles in *Melanogrammus*, Templeman & Hodder.

Glands.—Vascularisation of hypophysis lobe, Legait; neurosecretory fibres in hypophysis, Legait, H. & E.; hypophysis of *Hippocampus* "in vivo," Lage (2); innervation of hypophysis in *Hippocampus*, Lage (1); bucco-hypophysial canal, Olsson (3); pineal region of teleosts, Rasquin (4); pineal organ of *Thynnus*, Holmgren; vascularization of pineal body in *Esor*, Towarnicki; pituitary of *Cirrhitina*, Sathyanesan (2);

thyroid of some Japanese fishes, **Honma** (2); of *Bathypterois*, **Bougis & Ruivo**; of *Thunnus* and *Germo*, **Oliver-eau**; pancreas-like organ of *Myxine*, **Schreiner**; pancreas of *Wallago*, **Sinha**; of *Tilapia*, **Naguib**; pancreas islet system of *Protopterus*, **Leiner & Schmidt**, spleen of *Chaenoccephalus*, **Walvig**; adrenal and interrenal system in *Petromyzon*; **Sterba** (1); inter-renal organ of teleosts, **Krauter**; pituitary and thyroid of *Anguilla japonica*, **Honma** (3); thyroid, thymus, pancreas in *Tilapia*, **Al-Hussaini & Rizkalla** (1-3); buccal glands of *Petromyzon*, **Gibbs**, S. P.; nerve plexus control of gall bladder in *Myxine*, **Fänge & Johnels**; possible venom glands in *Pardachirus*, **Ochiai** (2).

Electric organs.—Of *Narcine*, **Mathewson & others**; of *Electrophorus*, **Luft**.

Respiratory system.—Comparison of in *Perca* and *Pleuronectes*, **Byczkowska-Smyk**; velum of *Myxine*, **Strahan**; reduction of gill-filaments and -lamellae in *Cyclothone microdon*, **Iwai** (3); respiratory surface of gills in *Carassius* and *Cyprinus*, **Solewski** (4) & (7); modification of operculum in *Gyrinocheilus*, **Lüling** (1).

Vascular system.—Of *Clarias lazera*, **Nawar** (2); blood cells of *Heteropneustes*, **Banerjee**; of *Salmo*, **Weinreb**; blood of *Hilsa*, **Pillay** (3); of *Cyprinus*, **Feja & Ljubica**; circulatory system of *Ophioccephalus*, **Marathe & Kulkarni**; vascular system in pseudobranchs of *Salmo*, **Solewski** (1); regulatory mechanism for blood in suprabranchial organ of *Latimeria*, **Millot & Anthony** (2); vascular sac of teleosts, **Necrasov**, **Adăscălitel & Oniceanu** (1); blood cell constituents, **Yuki**; innervation of heart, **Laurent** (3); **Jullien & Ripplinger**; fishes without erythrocytes and hemoglobin, **Ivanov**, K. P.; glomerular body in *Engraulis*, **Arena & Bolognari**.

Excretory system.—Aglomerulus kidney in some Japanese fishes, **Ogawa** (1) & (2); renal glomerulus of *Carassius*, **Roy**, R. K.; characters of Müllerian ducts in *Scyliorhinus*, **Gastaud** (2); thyroid follicles in *Carassius* kidney, **Chavin** (3).

Reproductive system.—Gonads of *Chanos*, **Tampi**; of *Tilapia*, **Al-Hussaini**

& **Rizkalla** (4); of *Cyprinus* in the first three years, **Solewski** (2); condition of gonads of *Tinca* in annual cycle, **Solewski** (3); seminal vesicles of *Heteropneustes*, **Sundararaj**; testis of *Salmo*, **Robertson**; ovaries of *Histrio*, **Antennarius** and *Ogcocephalus*, **Rasquin** (3); Selachian epigonial organ, **Varičák**; sperm & oocytes, **North**; cytology of spermatogenesis in *Lampetra*, **Chubareva** (2); histology of oogenesis in freshwater fishes, **Arndt**; formation of oocytes in *Wallago* and *Mystus*, **Dixit**; extra regional oocytes in teleosts, **Stolk** (4) & (10); structure of eggs, **Yamamoto**, T. S. (2); histology of periblast, **Nishida** (1 & 2); alveoli in *Lampetra* eggs, **Kusa**; formation of *Liopsetta* eggs, **Yamamoto K.** (2); egg capsules of Japanese Rajids, **Ishiyama** (1); shell gland of *Scyliorhinus*, **Threadgold**.

Teratology and pathology.—Teratological examples of fishes, **Bukirev & Pushkina**; of *Gobius ophioccephalus*, **Parenzan** (2); Moroccan Scorpaenids, **Boutière**; abnormal *Scoliodon*, *Carcharinus* and *Hypoprion*, **Menon M. D.**; teratological *Torpedo nobiliana*, **Palmer & Wheeler**; teratological examples of *Cyprinus*, **Goryunova** (2); abnormalities of vertebral column in *Cyprinus*, **Wunder** (2); *Salmo gairdneri* with three pelvic fins, **Maxfield**; deformed *Salmo*, **Guerra**; defects in larval *Salmo*, **Teichmann** (1); deformed *Oncorhynchus*, **Honma** (4); plecospondylic vertebral column in *Anguilla*, **Stolk** (1); tumours of fishes, **Stolk** (5), (6), (7), (9); some species-specific tumours, **Stolk** (2); condition of nucleus in normal and tumorous cells, **Stolk** (8); cytology of melanoma cells, **Greenberg**, **Kopac & Gordon**; buccal tumours in *Trichiurus*, **Pinto**, J. dos S.; effect of iodide on renal thyroid tumours, **Baker** (1); incidence and development of renal thyroid tumours, **Baker** (2); a myxofibroma in *Pleuronectes*, **Radulescu & Leonte**; degeneration of liver in *Salmo*, **Kubota**; anomalous aortic arch in *Lebistes*, **Gottschalk**; boring organisms in fossil fish teeth, **Bernhauser**.

Comparative morphology.—General, **Baer**; coronary arteries, **May & Herbert**; valvula cerebelli in teleosts, **Banarescu** (3); controlling mechanism of electric discharge in Mormyridae, **Szabo**, T.; homology of nostrils, **Schmalhausen**.

DEVELOPMENT

General.—Of *Carcharinus melanopterus*, Melouk; *Stenodus* and *Coregonus*, Smolyanov; of carp, Starmach; Zarnecki & Czubak; *Esox*, Gihl; Forsyth; *Heterotis*, Daget (1); *Mugil*, Anderson (1); Nair (2); *Gasterosteus*, Swarup (4); *Cynoglossus lingua*, Kuthalingam; developmental stages of fish, particularly *Cyprinus*, Balon (8); growth of body surface and respiratory surface of gills in *Carassius* and *Cyprinus*, Solewski (4); early development of *Antennarius*, Padmanabhan; *Barbatula*, Kobayashi & Moriyana; *Ctenopharyngodon* and *Hypophthalmichthys*, Inaba & others (1); *Girella Mito*; *Notropis* and *Camptostoma*, Reid; *Periophthalmus*, Kimura; *Petromyzon*, Bahr; *Sardina*, Oliver; *Seriola*, Uchida & others; *Tridentiger*, Dôtu (2); *Wallagonia*, Mazumdar, S. R. (2); technique of embryological study, Gihl.

Eggs.—Of *Lampetra*, Chubareva (1); *Salmo*, Devillers & Rajchman; *Cynopocilus* and *Pterolebias*, Siegel; *Ambassis*, Nair (1); *Chromis*, Fujita (1); *Sebastes oblongus*, Fujita (3); *Antennarius* and *Histrio*, Rasquin (3); position of nucleus in *Lebistes* egg, Clavert & Filogamo (1); rotation of egg of *Lebistes*, Clavert & Filogamo (2); oocyte of *Liopsetta*, Yamamoto, K. (1); early segmentation in *Petromyzon* eggs, Veit; effect of low oxygen levels on *Oncorhynchus* eggs, Alderdice & others; effect of CO₂ on *Oncorhynchus* eggs, Alderdice & Wickett; effect of Zn ions on *Salmo* eggs, Yamamoto, T. S. (2); formation of gelatinous membrane, Ivanov, M. F.

Embryos.—Of *Carcharinus melanopterus*, Melouk; *Sargichthys*, Okada & Mori (3); *Salmo gairdneri*, Pleva; European Salmonidae, Spaas & Heuts; of *Abramis*, Dziekonska; *Leuciscus idus*, Popescu, E. & others; *Brachydanio*, Hisaoka & Battle; *Antennarius* and *Histrio*, Rasquin (3); yolk absorption in *Etmopterus*, Iwai (1); periblast in *Oncorhynchus*, Nishida (1) & (2); adhesive apparatus in *Esox*, Gihl; *Esox* embryos in paraffin oil, Domurat; physiology of hatching in teleost embryos, Buznikov.

Larvae and young.—Of *Lampetra*, Balon (5); of *Acipenser*, Semenov; Dragomirov; *Hucho*, Balon (2); *Blicca*, Frank (2); *Cyprinus*, Balon (6); *Mormyrus*, Daget (5); *Esox*, Čihař (2); *Ambassis*,

Nair (1); *Anoplopoma*, Kobayashi, K. (1); *Chromis*, Fujita (1); *Caranx crysos*, McKenney & others; *Katsuwonus*, Ishiyama & Okada; *Mugil cephalus*, Anderson (3); *Sebastes*, Fujita (2); Cottidae and Comephoridae, Taliev; ventral adhesive papillae in *Neolebias*, Schapitz (3).

Metamorphosis.—Of *Albula*, Rasquin (1); *Vinciguerria*, Ahlstrom & Counts.

Neoteny.—In *Lampetra*, possible influence of environment, Zanandrea (3).

Organogeny and histogenesis.—Of accessory structures in *Fundulus*, Oppenheimer (1); of brain in *Fundulus*, Oppenheimer (2); *Arius* and *Plotosus*, skulls, Srinivasachar (3); *Heteropneustes* skull, Srinivasachar (4); chondrocranium of *Silonia*, Pangasius and *Ailia*, Srinivasachar (1); *Trichopodus*, Marathe & Bal (1); *Mastacembelus*, Bhargava; sensory line system and dermal skull of *Polypterus*, Pehrson; hyoid arch of *Rhinobatus*, Hamdy (3); caudal skeleton of *Eleutheronema* and *Trichopodus*, Marathe & Bal (2); ontogenesis of Reissners' fibre, Olsson (1); persistence of larval pectoral fins, Ostermüller (2); buccal glands of *Petromyzon*, Gibbs S. P.; mucous membrane of *Cyprinus* alimentary tract, Krassukova; development of eye in *Petromyzon*, Lebkova; in *Esox* and *Salmo*, Nüesch; eye muscles of *Torpedo*, Wedin; extrinsic ocular muscles in *Salmo*, Bodemer (2); *Lepisosteus*, Bodemer (1); pronephros of *Oncorhynchus*, Ford & Newstead; kidney of *Oryzias*, Rangarajan; egg membrane of *Nemachilus*, Sterba (3); chemical control of histogenesis, Trinkaus & Drake.

Effect of external factors.—On development of *Esox*, Tshörtner; influence of temperature on speed of development in *Dascyllus*, Koenig; on meristic characters of *Pleuronectes*, Molander & Molander-Swedmark; on respiratory metabolism of young *Salmo*, Marckmann; effect of artificial light on *Oncorhynchus* eggs and larvae, Eisler (2); effect of light duration on meristic characters, Lindsey; effect of differing oxygen tensions on respiration during ontogeny, Priwolnjev.

Regeneration and degeneration.—Regeneration of fins in *Fundulus*, Goss & Stagg; of fins after clipping, Stuart (2); results of fin transplantation, Kallman & Gordon (1); of scale transplantation,

Hildemann; regeneration of *Ameiurus* taste barbel, Goss; Kamrin & Singer; experiments on internal organs of *Cyprinus*, Wunder (1).

PHYSIOLOGY

Senses.—Retinal response to electrical stimulus, Konishi (5); response of visual centre to light stimulation, Konishi (3) & (4); light-sensitivity in a blind fish, Marshall & Thines; visual pigments of deep sea fishes, Wald & Brown; photosensitivity of retinal pigments of some deep sea fishes, Munz (1), (2); effect of illumination on retinal movement, Kobayashi, H. (3); selective light absorption by the lenses, Kennedy, D. & Milkman; visual perception of movement, Boulet; light sensitivity of pineal organ in *Astyanax*, Grunewald-Lowenstein; function of otoliths, Farkas; response to sound stimuli, Suyehiro & others; scent perception in *Anguilla*, Teichmann (2); thermo receptors in fishes, Serbenyuk & Manteifel; reaction of *Carassius* and *Macropodus* to differing patterns, Rensch.

Lateral line system.—Relation between function and habits of fish, Tsukamoto & Yoshino (2); directional audibility through lateral line, Kuroki.

Nervous system.—Neurosecretion in marine teleosts, Enami & Imai (1) & (2); neurosecretion in *Misgunus*, Enami (1); initiation of cardiac contractions, Laurent (2).

Digestion.—Digestive tract in poikilothermal fishes, Plisetskaya.

Nutrition.—Residual effect of starvation of fry, Mekhanik.

Metabolism.—Fatigue in fishes, Giaja & Markovic-Giaja (1) & (2); oxygen consumption in Salmonidae, Spass; oxygen consumption in *Salvelinus*, Job (1); in *Chanos*, Job (2); in *Carassius* at differing temperatures, Ekberg; in *Labeo* fry, Motwani & Bose; in some Cyprinoids, Chen & Shih; in relation to weight in *Gadus*, Sundnes; related to temperature adaptation in *Scorpaena*, Gelineo (5); nocturnal oxygen consumption of *Scorpaena*, Gelineo (4); oxygen consumption at a controlled temperature, Gelineo (1); effect of electrolytes on oxygen uptake, Lazarow & others; metabolism in *Carassius*, Hoar (1);

calcium metabolism in *Tilapia*, Garrod & Newell; testosterone metabolism in *Lebistes* and *Gambusia*, Chiaffi & Lutio; ammonia production in *Oryzias* embryos, Ishihara; anaerobic metabolism, Blažka; effect of metabolic rate on reaction in an electrical field, Halsband; effects of diet on temperature resistance of *Carassius*, Irvine & others.

Respiration.—In *Gyrinocheilus* when fixed by oral sucker, Lüling (1); respiratory surface of gills in *Cyprinus*, Solewski (7); counter current exchange in gills of fish, Scholander; conditioned inhibition of respiration in *Carassius*, Otis & others; accessory respiratory organs of *Clarias*, Moussa; respiratory reflex in fishes, Konishi (2); control of respiration, Konishi (1); pressure changes occurring during respiration, Hughes & Shelton; respiratory rate of *Salmo* heart during development, Grodzinski & Pigon.

Blood.—Respiratory function of blood in *Lampetra*, Pavlov & Skirstymonskaja-Krolik; plasma volume of some elasmobranchs, Thorson; influence of fresh and salt water on plasma content in *Tinca*, Cordier, D. & others; oxygen capacity of blood in *Pomoxis* and *Lepomis*, Burke & Woolcott; haemoglobin concentration related to activity, Gelineo (3); seasonal changes in circulation, Hart; blood cells of *Salmo*, Weinreb; blood protein variations in *Anguilla*, Cordier, D. & others (1).

Osmotic relations.—Osmoregulation in *Lampetra*, Morris; size in relation to osmoregulation in Salmonid fishes, Parry; effect of low temperature on osmoregulation in *Gadus*, Woodhead; experiments on osmoregulation in *Lepadogaster*, Raffy; osmoregulation in marine larval fishes, Shelbourne (2); gas exchange in fish., Stefan, M.; osmotic properties of *Polistotrema*, McFarland & Munz; response of young *Oncorhynchus* to salinity differences, Houston; lethal barriers for *Cyprinus* passing from fresh to salt water, Moutquand, Edel & Chighizola; counter current exchange in swim bladder and gills, Scholander; tolerance to oil dilution of water, Cole & others; site of chloride regulation in marine larvae, Shelbourne (1); role of Stannius corpuscles, Rasquin (2); nitrogen excretion, Wood.

Swim bladder.—Gas secretion, **Sundnes & others**; secretion of inert gas, **Wittenberg**; secretion of hydrogen ions, **Hogben**; counter current exchange in the swimbladder, **Scholander**; relation to acoustic reflexion properties, **Jones, F. R. H. & Pearce**.

Locomotion and equilibration.—Method of analysis of swimming, **Nursall (1)**; manoeuvrability in fishes, **Aleev (1)**; locomotion of fishes, **Bainbridge, R. (2)**; swimming speeds related to size and tail beat, **Bainbridge, R. (1)**; terrestrial locomotion of *Clarias*, **Johnels (1)**; effect of temperature on swimming speed of young *Oncorhynchus*, **Brett & others**; age of assumption of reversed swimming position in *Synodontis*, **Pinter (3)**; turning in a vertical plane by *Zeus*, **Aleev (2)**; flying of *Carnegiella*, **Weitzman (1)**; role of fins in *Tetraodon*, **Ostermüller (1)**; buoyancy of bathypelagic fishes, **Denton & Marshall**.

Influence of temperature.—On activity of young *Salvelinus*, **Fisher & Sullivan**; temperature preference of *Salmo*, **Garside & Tait**; temperature range for *Rutilus*, **Cocking**; effect of temperature on growth, **Tsukuda & Katayama**; on thyroid function in *Anguilla*, **Leloup (2)**.

Colour.—Colour of some Japanese fishes, **Kuroda (1)**; colour changes in *Badis*, **Niwenhuizen (4)**; influence of environment on colour change in *Histrio*, **Breder & Campbell**; colour-pattern assumed by each sex when guarding brood, **Kuenzer (1)**; unusual pigmentation in an injured *Solea*, **Chabanaud (2)**; white chromatophores (antaugophores) in *Bathygobius*, **Fries**; effect of adrenalin on colouration, **Pora**; reactions to hormonal stimulation, **Rasquin (4)**; colour-change influenced by pH of water, **Weingarten**; control of chromatic system, **Castrejon & Flores**; movement of granules within melanophore, **Ishibashi**; distribution of xanthophylls in fishes, **Hirao & others**.

Endocrinology.—Effect of hormones on melanophore reaction, **Rasquin (4)**; role of endocrines in melanogenesis, **Chavin (1)**; ultrastructure of hypophysis of some teleosts, **Legait, E. & H.**; physiology of pituitary, **Pickford & Atz**; effect of temperature on thyroid-pituitary relationship, **Fortune**; role of endocrines in temperature adaptation,

Auerbach; action of potassium, magnesium and calcium ions on thyroid functions in *Salmo*, **Etienne**; thyroid function in *Carassius*, **Chavin (2)**; effect of aestivation on thyroid function, **Leloup (1)**; independance of sexual maturity on endostyle-thyroid metamorphosis in *Lampetra*, **Zanandrea (3)**; hepatic modification caused by hormone injection during vitellogenesis, **Clavert & Zahnd**; effect of thiourea on development of *Carassius*, **Honma & Murakawa**; effect of sex hormones on kidneys of *Gasterosteus*, **Oguro (1) & (2)**; effects of histamine and antihistamine on *Mustelus* and *Torpedo*, **Jullien & others**.

Electric organs.—Of Mormyridae and Gymnotidae, **Lissmann (1)**; electrical receptor in *Mormyrus*, **Wright**; effect of potassium on electroplax of *Electrophorus*, **Altamirano & Coates**; effect of temperature on electroplax activity in *Electrophorus*, **Schoffeniels (2)**; acetylcholine system in *Malapterurus*, **Augustinsson & Johnels**; function and evolution, **Lissmann (2)**.

Electrical properties.—Method of potential production in nerve cell of *Spheroides*, **Hagiwara & Saito**; response of fingerlings to a moving field of direct current, **Raymond**; sensory perception of electrical discharge by *Gymnarchus*, **Lissmann & Machin**.

Effects of chemicals etc.—Effects of CO₂ and urethane on *Scyliorhinus*, **Coraboeuf & Gargouil**; toxicity of DDT to *Salmo*, **Gagnon**; effects of DDT, **Corbet (2)**; effect of insecticide on *Carassius* and *Oryzias*, **Matsue & others**; effects of chlordane on Cyprinids, **Ananiades**; effect of ergot drug on *Betta*, **Evans & others (2)**; poisonous effects of sodium nitrite, **Klingler**; effects of heavy metal salts, **Schweiger**; effect of chlorinated hydrocarbons on fishes, **Webbe**; effect of dieldrin, **Harrington & Bidlingmayer**; effect of temperature on toxicity of dipterylamine, **Tammes**.

Effects of radioactivity and X-rays.—Radioactive effects in some pelagic fishes, **Tozawa & others**; estimation of total radioactivity in marine fishes, **Burroughs & others**; uptake of radioactive zinc, **Chipman & others**; uptake of calcium-45 by *Lebistes*, **Rosenthal (1)**; uptake of strontium by *Lebistes*, **Rosenthal (3)**; uptake of calcium-45 and strontium-90, **Rosenthal (2)**; strontium

intake of tissues, **Hiyama & Ichikawa**; strontium concentration in tissues, **Ichikawa & Hiyama**; uptake and accumulation of radionuclides, **Boroughs & others**; fixation of radioactive phosphor in brain and other tissues of *Salmo*, **Palayer**; effect of X-rays on testis-ovum production in *Oryzias*, **Egami (3)**; on spermatogenesis in *Salmo fry*, **Niiyama**.

Tropisms.—Response to varying light intensities, **Imamura**; light reaction in fish, **Protasov (1)**; reactions of *Clupea*, to light, **Dragesund**; effect of photoperiodism on current response in young *Salmo*, **Northcote**; galvanotropism in *Salmo*, **Adelman & Haskell**; in *Carassius*, **Viand & Dreyfus**.

BIOCHEMISTRY

Of fishes (review), **Tarr**; chemical analysis of Ceylon fishes, **Lantz & Gunasekera**; of *Ethmalosa*, **Watts (1)**; tissue chemistry of *Dallia*, **Nardone**; fat content of *Anguilla*, **Thurrow (1)**; oil and fat content of *Scomber*, **Acara (1)**; cholinesterase in fishes, **Lundin**; cholinesterase activity in freshwater fishes, **Clos & Serfaty**; thyroprotease in *Scyliorhinus*, **Clements**; differences of carotenoid content in *Labrus*, **Abolins**; amylases in *Mugil*, **Seshadri**; amino acids of *Thunnus*, **Rossi-Fanelli & others**; occurrence of trimethylamine oxide in *Fundulus*, **Ogilvie & Warren**; vitamin content of liver of some fishes, **Gheorghe**; vitamin A content of liver of *Carcharias taurus*, **Cadenat (1)**; vitamin A and carotinoid content in *Cyprinus*, **Brunner & others**; synthesis of vitamin A₂ in *Gambusia*, **Grangaud & Moatti**; vitamin B₆ content of fish liver, **Yanase**; DNA and protein content of liver of *Cyprinus* × *Carassius* hybrids, **Ojima**; Na and K content of *Oncorhynchus* muscle, **MacLeod & others**; chemical changes in muscles of *Salmo* embryos at high temperatures, **Vorbrodt**; astaxanthin in *Gadus* muscle, **Baalsrud**; muscle proteins, **Moretti & others**; glycogen of striated muscle in marine fishes, **Cordier, D. & M.**; protein content of fish muscle and blood, **Kikuchi & others**; blood proteins of *Cyprinus*, **Flemming**; of *Anguilla*, **Cordier, D. & others (1)**; of *Labrus*, **Fine & Drilhon**; blood constituents using electrophoresis, **Drilhon, Fine & Doualas**; comparison of foetal and maternal haemoglobin in

Squalus, **Manwell**; haemoglobins of *Petromyzon*, **Adinolfi & Chieffi**; amino acid content of *Thunnus* haemoglobin, **Marco & Antonini**; assessment of haemoglobin of blood of marine fishes, **Gelineo (2)**; serology of Cottidae and Comephoridae, **Taliev**; serum protein of fish blood, **Saito, K.**; blood physiology of carp, **Sorvachev, K. F.**; electrophoretic patterns of serum of some species, **Antonaci & Macagnino**; serum content of *Carassius* after hormone injection, **Bailey, R. E.**; chemical constituents of blood of *Anguilla*, **Sano, T.**; of *Protopterus*, **Plessis**; variation in blood sugar content in *Cyprinus*, **Münnich**; of *Oncorhynchus*, *Anguilla* and *Parasilurus*, **Fukuda**; blood coagulation in *Cyprinus*, **Jara (2)**; assessment of cardiac glycogen, **Cordier**; disappearance of radio-activity from blood, **Boroughs & Reid**; hematology and tissue composition of marine teleosts, **Becker & others**; renal resorption of carbohydrates in *Carassius*, **Jaffee**; occurrence of acid Schiff in *Pseudoscarus* pituitary, **Matty**; ureogenesis in elasmobranchs, **Baldwin**; distribution of alkaline phosphatase in alimentary canal, **Broussy & Serfaty**; distribution of acetylcholinesterase in electric organ of *Electrophorus*, **Couceiro & others**; cholesterol content in brain of *Ophicephalus*, **Hsu & Jen**; studies on *Oncorhynchus* during spawning migration, **Idler & others**; pteridines in fish scales, **Dupont**; zinc in *Anguilla* neurons, **Enami (2)**; secretion of buccal glands of *Petromyzon*, **Gibbs, S. P.**; retinal pigments of a Labrid, **Munz (3)**; analysis of *Gadus* otoliths, **Dannevig**; physico-chemical characters of eggs at fertilization, **Hamano**; chemical changes in activated egg membrane, **Yamamoto, T. S. (3)**; changes in chemical composition of *Salmo* eggs during development, **Suyama & Ogino**; egg lipids of *Oncorhynchus*, **Zama & others**; of *Liopsetta*, **Yamamoto, K. (2)**; amino acid composition of *Salmo* eggs, **Suyama**; components of perivitelline fluid in *Oryzias* egg, **Ohtsuka**; formation of yolk globules in *Clupea* oocytes, **Yamamoto, K. (1)**; histochemical study of oocytes of *Ophicephalus*, **Chopra**; effect on eggs of carotenoid deficiency in females, **Hubbs, Clark & Stavenhagan**; hardening of egg membrane following fertilization, **Zotin**; nucleoproteins in spermatozooids, **Knobloch, Matsudaira & Vendrely**; amino acids in pituitary and ovary of

Mystus, Krishnamoorthi; histochemistry of luminous organ of *Maurollicus*, Bassot; luminescence in *Parapriacanthus*, Haneda & Johnson.

REPRODUCTION AND SEX

Age and size at sexual maturity.—Of *Clupea pallasi*, Nagasaki; of *Oncorhynchus*, Godfrey (2); Skud; of Salmonids, Branko; of *Esox* from Saskatchewan, Schultz, F. H.; of *Gadus*, Powles; of some W. Australian fishes, Thomson (3); age, death after one spawning in *Scardinius*, Müller, G. J.; experiments on *Conger*, Mousset.

Differences between the sexes.—Sexual dimorphism in *Barbus curmuca*, Raj; *Synodontis*, Pinter (3); *Pachypanchax*, Nieuwenhuizen (2); *Steatocranus*, Wickler (4); *Gomphosus*, Strasburg & Hiatt; Scarids, Winn & Bardach; *Clinostomus*, Schwartz & Norvell; sex determination in *Tilapia*, Mathieu; false gonochorism in *Coris*, Bacci & Razzauti (1).

Spawning season and place.—Of *Mallotus*, Pitt (1); *Wallagonia*, Mazumdar, S. R. (2); *Seriola*, Mitani (2); *Trachurus japonicus*, Hotta & Tamura; *Sarda*, Demir; *Mugil*, Anderson (1) & (3); *Barbatula*, Kobayashi & Moriyana; spawning season of *Sardina* off Balearic Isl., Oliver; *Hilsa* in Ganges, Motwani & others; *Clupea* in Kandalek Bay, Altukhov; *Engraulis* in Mljet lakes, Vučetić; *Scardinius racovitzai*, Müller G. J.; *Vimba* in the Don river, Zhukovskii; *Scomber* in Marmara and Black Seas, Demir & Arim; *Katsuwonus* and *Neothunnus*, Matsumoto; some Nile fishes, Nawar (3) & (4); some W. Australian fishes, Thomson (3); nature of spawning area of *Clupea*, Bolster & Bridger; spawning grounds of Atlantic-Scandinavian *Clupea*, Yudanov; *Anguilla japonica*, Matsui; *Rastrelliger*, Balakrishnan; *Xiphias* in Marmara Sea, Demir, Acara & Arim; *Mugil cephalus*, Arnold & Thompson.

Factors influencing spawning.—Of *Salmo*, Jitariu & others; *Clupea*, Brandhorst; *Hypomesus*, Shiraiishi & Tokunaga; *Gasterosteus*, Baggerman; of fishes in Welna river, Poland, Kaj (2); effect of distribution on spawning time, Qasim (1); photoperiodicity and sex cycle in *Notropis*, Harrington (1);

Breeding habits.—Of *Petromyzon*, Bahr; *Blicca*, Frank (2); wild *Carassius*, Matsushima; *Etheostomatinae*, Winn (1); *Apistogramma*, Kuenzer (1); *Cynolebias ladigesi*, Foersch; *Cynolebias whitei*, Carvalho, A. L. de (1) & (2); *Xiphophorus*, Wickler (2); *Gadus*, Templeman (1); *Monocirrhus*, Gordon, M. (2); *Spondyliosoma* and *Labrus*, Wilson; *Symphysodon*, Gordon, M. (4); *Tilapia karomo* and *T. variabilis*, Lowe (1); *Steatocranus*, Wickler (4); *Aequidens*, Lorec; *Blennius fluviatilis*, Wickler (3); *Otenopoma*, Nieuwenhuizen (3); spawning behaviour of *Oncorhynchus*, Sano, S. & Nagasawa; *Esox*, Fabricius & Gustafson; *Ctenopharyngodon* and *Hypophthalmichthys*, Inaba & others (1); *Rhinichthys*, Schwartz; *Oryzias*, Ono & Uematsu; *Pachypanchax*, Nieuwenhuizen (2); *Perca*, Fabricius; of *Nothobranchius* in aquarium, Friese; *Ambassis*, Hartel (1); *Badis*, Nieuwenhuizen (4); *Anabantidae*, Ladiges (1); fighting between males, Schapitz (3); Aggression and pseudo-pairing between males, Nieuwenhuizen (1).

Reproductive cycle.—Of *Cyprinus* in Volga delta, Alekseeva; Volga estuary *Cyprinids*, Koshelev; development and ripening of gonads in *Cyprinus*, Solewski (2) & (5); annual cycle of gonads in *Tinca*, Solewski (3); effect of temperature on *Phoxinus*, Ioff; cycle in *Centronotus*, Qasim (2); gestation period in *Etmopterus*, Iwai (1); factors affecting reproductive cycle, Sergeant.

Spermatogenesis & oogenesis.—Nath; gametogenesis in fishes, Narain; rare giant spermatozoa in *Carcharinus melanopterus*, Melouk; spermatogenesis in *Ophicephalus*, Vasisht; development of testes after unilateral gonadectomy, Robertson; effect of potassium fluoride on ovulation in *Cobitis*, Nadamitsu.

Reproduction.—Supposed viviparity of *Thrissops*, Nybelin (2); parturition in *Prionace*, Tucker & Newnham; reproduction of *Chanos*, Tampi; *Alosa*, Hoestlandt; *Heterotis*, Daget (1); *Protopterus aethiopicus*, Greenwood (3); ethology of in *Protopterus dolloi*, Brien, Poll & Bouillon (2); drought requirements and tolerance of *Cynolebias* eggs, Foersch.

Fertilisation.—Experiments on, Rothschild; fertilization in *Lebistes*, Ghenin; mechanism of monospermic

fertilization in eggs, **Kanoh**; duration of sperm function, **Hubbs & Drewry**; activation of spermatozoa in region of micropyle, **Yanagimachi** (1); role of calcium ions during fertilization in *Acipenser*, **Detlaff**; *Clupea*, **Yanagimachi** (2); fertilization of *Clupea* egg with membrane removed, **Yanagimachi** (3); experiments on micropyle of *Clupea* egg, **Yanagimachi** (4); activation of *Plecoglossus* eggs in organic fluids, **Ito, S.**

Parthenogenesis.—In *Lebistes* and *Xiphophorus*, **Stolk** (3).

Hermaphroditism.—In *Salmo clarki*, **Benson**; *Oncorhynchus*, **Hikita** (3); *Coris*, **Bacci & Razzauti** (2); occurrence of oocyte in testis of *Barbus*, **Sathyanasan** (1); self fertilization in *Lebistes*, **Spurway** (1).

Hormones and sex.—Mammalian hormones as ovulating agents in *Heteropneustes*, **Ramaswami & Lakshman**; induced spawning in *Heteropneustes* following hormone injection, **Ramaswami & Sundararaj** (1) & (2); hormone induced gonopodial structure in ♀ *Lebistes*, **Ishii**; masculinisation of female gonads of *Lebistes* by hormone injection, **Mohsen** (3); (4); appearance of male character in female *Oryzias* following hormone treatment, **Egami** (1); changes in gonadal state of *Oryzias* following hormone administration, **Egami** (5); production of testis-ova in male *Oryzias*, **Egami** (2) & (3); induced sex reversal in *Oryzias*, **Yamamoto, T. S.** (1) & (4); acceleration of spawning in *Misgurnus* by hormone injection, **Kobayashi & Yamabayashi**; changes in *Bathygobius* following pituitary implantation, **Stoll**.

Number of eggs produced.—By *Salmo* spp., **Pekarkova**; North American salmonids, **Rounsefell** (1); number of eggs from winter forms of *Salmo*, **Zarnecki** (2); fecundity of Baltic *Clupea*, **Bückmann & others**; *Sardinops*, **MacGregor**; *Hypomesus japonicus*, **Ito, K.**; *Puntius*, **Ibrahim**; *Gadus*, **Powles**; *Seriola*, **Uchida & others**; *Pleuronectes*, **Bagenal**; *Limanda*, **Bohl**; North Sea Heterosomata, **Kändler & Pirwitz**; West Australian fishes, **Thomson** (3); ova production of *Alosa*, **Davis**; numbers and survival of eggs in *Cynolebias*, **Foersch**.

Parental care.—In *Galeichthys*, **Atz** (4); *Hemichromis*, **Spatz**; *Apistogramma* and

Nannacara, **Butz & Kuenzer**; oral incubation in *Geophagus*, **Reid, M. J. & Atz**; starving of parent while brooding in *Haplochromis*, **Kibbat**; evidence of special skin secretion on which young feed in *Symphysodon*, **Weingarten**; male *Tetraodon* guarding and fanning eggs, **Geiser**; use of mouth by male, **Kuenzer** (2).

EVOLUTION, VARIATION AND GENETICS

Evolution.—Trends in teleost evolution, **Myers** (1); transformation from protractile mouth to tubular snout, **Le Danois**; transition of afferent branchial arteries from fish to amphibian, **Das & Saxena**.

Hybrids.—Fertility of *Coregonus* hybrids, **Gasowska**; sterility and inviability of Cobitid hybrids, **Minamori** (2); intergeneric hybrids in Cobitidae, **Kobayashi, H.** (1); *Abramis brama darmbii* × *Rutilus rutilus* hybrid, **Pavlov**; hybrids of species of *Labeo* and *Cirrhitina*, **Husain**; natural hybrids between *Esox* spp., **Raney** (3); between *Perca* and *Lucio-perca*, **Balon** (3); hybridization amongst different species, **Nikolyukin**; histological study on *Platichthys* × *Parophrys* hybrids, **Aron**; fertility of F¹ hybrids, **Hubbs, Clark** (1); relation of duration of sperm function to hybridization, **Hubbs, Clark & Drewry**.

Genetics.—Of *Betta*, **Wallbrunn**; heteroploidy in *Gasterosteus*, **Swarup** (1); Mendelian inheritance in hybrids of *Astyanax* and *Anoptichthys*, **Sadoglu**; of fin transplantation in Cyprinodonts, **Kallman & Gordon** (2); control of pigment cell patterns in *Platyopocilus*, **Gordon, M.** (1); genetics of embryonic development of European Salmonidae, **Spaas & Heuts**.

Chromosome studies.—Sex determining chromosomes in *Cottus*, **Nogusa** (1); studies on Gobiid fishes, **Nogusa** (2).

Raciation and speciation.—Of Baikal Cottidae and Comephoridae, **Taliev**; Acipenseridae, **Gerbilskii** (1); **Pickford**; racial studies on some Rumanian freshwater fishes, **Banarescu** (4); races of *Clupea*, **Tambovtzev**; characterisation of populations and definition of races in *Clupea*, **Wielinga**; biological differentiation in species limits, **Gerbilskii** (3); problems of speciation, **Sará**; species problem in *Coregonus*, **Brooks**; heterosis and reproductive isolation, **Spurway** (2).

Albinism, ambicoloration etc.—Albinism in *Arius*, Gupta & Bhowmick; *Oncorhynchus*, Hikita (2); albinism and ambicoloration in *Paralichthys*, McKeever; ambicolorate *Paralichthys*, Deubler & Fahy; *Platichthys*, Ghirardelli; an orange-coloured *Lepisosteus*, Phillips, C.; golden form of *Nemachilus*, Frank (4); colour varieties of *Misgurnus*, Kobayashi, H. (2); melanism in hybrid *Xiphophorus* × *Mollienisia*, Elwin.

Biometric studies.—On young *Megalops*, Harrington (2); *Brevoortia*, June; *Cetengraulis*, Berdegue (2); *Sardina*, Matta (2) & (3); *Mallotus*, Pitt (1); *Cyprinus*, Mišik (3); *Cobitis*, Mišik (2); *Aphanius*, Lozano Cabo (2); *Spicara*, Dieuzeide & Roland (3); *Thunnus*, Doumenge & Lahaye; *Neothunnus*, Kurogane & Hiyama (1); *Nakagome* (1); Central Pacific Istiophoridae, Royce; Moroccan Scorpaenids, Boutière; *Trigla*, Monteiro (1); *Anoplopoma*, Phillips & others; variation of gill raker count in *Alosa*, Furnestin & Vincent; vertebral counts on some Spanish fishes, Larrañeta (2).

Phylogeny.—Romer (2); origin of vertebrates, Piveteau; continental faunas, Westoll; Crossopterygii and origin of tetrapods, Jarvik; Reissner's fibre, Olsson (1); subcommissural organ, Olsson (2).

Variation.—In *Notropis*, Gibbs, R. H. (2); in egg complement and size, Hubbs, Clark (2); in number of glomeruli of fresh and salt water fishes, Ford; adaptive significance of individual variability, Nikolski & Pikuleva.

ECOLOGY AND HABITS

General bionomics.—Of *Carcharias taurus*, Cadenat (1); *Clupea pilchardus*, Heldt (1); *Sardinella gibbosa*, Ganapathi & Rao; *Cetengraulis*, Howard & Landa; *Stolothrissa tanganicae*, Marlier (2); *Hilsa*, Pillay (2); Irish *Salmo*, Went (1); *Salmo gairdneri* and *Oncorhynchus kisutch*, Shapovalov & Taft; *Salvelinus*, Van Oosten & Eschmeyer; *Coregonus* and *Salvelinus* in two Alberta lakes, Cuerrier & Schultz; *Coregonus clupeoides*, Slack & others; *Thymallus* in Murmansk area, Vladimirovskaya; *Esox*, Munro, W. R.; *Shilenkova*; Baltic *Esox*, Hegemann; *Umbra*, Libosvarsky & Kux; *Capoetobrama*, Maxunov; *Wallagonia*, Mazumdar, S. R. (2); Portuguese *Gambusia*,

Franca, P. da & M. de L. (1); *Hippocampus zosterae*, Strawn; *Tilapia nilotica*, Lowe (2); *Thunnus*, Akyüz & Artüz; *Orcynopsis*, Postel (1); some tropical E. Atlantic scombroids, Postel (3); *Ctenogobius*, Dôtu (3); *Luciogobius*, Dôtu & Mito; *Paleatogobius*, Dôtu (1); *Sicyopterus*, Manacop; *Tridentiger*, Dôtu (2); Moroccan *Scorpaena*, Boutière; Baikal Cottidae and Comephoridae, Taliev; *Limanda*, Bohl; some Moravian fishes, Hochman.

Age and growth.—Of *Sardina*, Larrañeta & Lopez; *Chondrostoma*, Banarescu & others; *Dorosoma*, Berry (4); *Pomolobus*, Graham, J. J.; *Osmerus*, McKenzie; *Salmo lacustris*, Merlo (1); *Vistula Salmo*, Zarnecki (3); river Lee *Salmo*, Newman; *Salvelinus*, Desmarais; marked *Salvelinus*, Cable; *Coregonus* in Arendsee, Bauch (1); *Mallotus*, Pitt (2); *Esox* from Saskatchewan, Schultz, F. H.; *Cyprinus*, Schoffman (1); *Cyprinus* in Roumania, Papadopol (1); *Reporhamphus*, Ling; *Gadus* in Karsk Sea, Pokrovskaya (1); *Perca*, Frank (3); *Lepomis*, Costanzo; *Lucioperca*, Biely (2); *Stizostedion*, Hassler (1); *Morone*, Schoffman (2); *Micropogon*, Suttkus (1); *Tilapia* spp. and *Lates*, Jensen; *Gobius minutus*, Swedmark; Turkish *Mugil*, Denizci; *Sebastes*, Sandeman; *Anoplopoma*, Phillips & others; Southern Baltic *Pleuronectes*, Molander; Soleoid fishes, Ochiai (1); Balaton Lake fishes, Entz & Lukacovics; age and size of Manx *Clupea*, Bowers; *Pilodictis*, Cross & Hastings; growth increase of *Salmo* after flooding, Campbell; growth of *Salmo trutta*, Stinson; *Salmo* in Lough Glore, Healy & Kennedy; relation between phytoplankton photosynthesis and growth of *Oncorhynchus nerka*, Nelson; growth of *Cyprinus*, Necrasov & others (2); Zarnecki (1); *Cyprinus* in natural and artificial waters, Necrasov & others (3); carp from differently managed ponds, Czubak & Zarnecki; *Abramis* in Danube delta, Papadopol (2); *Rutilus*, Balon (1); *Scardinius*, Cihar & Frank; *Clinostomus*, Schwartz & Norvell; *Anguilla* in IJsselmeer, Deelder (1); *Merluccius*, Matta (1) & (4); *Melanogramma aeglefinus*, Wise (1); *Lota*, Müller, W.; *Perca*, Le Cren (1); *Vimba* and *Chalcalburnus*, Kasumov; *Chrysophrys*, Longhurst (2); *Mullus*, Bougis & Muzinic; *Centronotus*, Qasim (2); young *Mugil cephalus*, Anderson (3);

Mugil curema, Anderson (1); Scorpaenidae of Morocco, Boutière; *Pleurogrammus*, Kyushin; fish in Kozłowa Góra reservoir, Poland, Dyszewska & Markiewicz; some marine fishes in aquaria, Hirotsaki & others; differences in rate of growth of Caspian, Black and Azov sea clupeoids, Svetovidov (2); age composition of *Sardinops* in commercial catches, Davies (2); growth rhythm of *Chondrostoma*, Stefan, G.; comparison of specific with average growth of *Salmo*, Kodama; seasonal variation in growth rate of *Salmo*, Swift; large *Salmo* in Iceland, Gudjonsson; factors influencing size of year class of *Gadus*, Wiborg; average weight of Portuguese *Sardina*, Oliveira & Pinto; length-weight relationship in *Esox*, Čiháň (1); weight/length data on *Chrysophrys*, Cassie; weight/length relationship of some Indian fishes, Moitra (1); effect of light on early growth in *Oncorhynchus*, Eisler (1); growth of *Sardina* related to temperature, Muzinic (1); effect of temperature on growth of *Gadus*, Taylor (2); effect of diet on growth of *Ictalurus*, Gray; allometry in early development of *Esox*, Gühr; adaptive significance of growth rate, Vasnetzov; relative weights of internal organs during growth, Lühmann & Mann; annual fishes, Carvalho, A. L. de (1); longevity of *Scardinius* in thermal pond, Müller, G. J.

Fish marking experiments.—In Quebec waters, Vladikov; on some Brazilian freshwater fishes, Godoy; results of *Clupea* tagging in Bay of Fundy, McKenzie & Tibbs; in British Columbia, Taylor, F. H. C. & others; tagging experiments on *Oncorhynchus*, Milne; survival and spawning of marked *Oncorhynchus*, Nelson & Abegglen; growth of tagged and untagged *Salvelinus*, Smith, M. W. (1); southern range of marked *Gadus*, Wise (2); tagging experiments on *Gadus* off Nova Scotia, McCracken (1); in Barents Sea, Trout (2); on *Anoplopoma*, Phillips & others; an inexpensive fish tag, O'Rourke & Makings; use of Lea's hydrostatic tag, Smith, M. W. (2); use of fin clipping, Stuart (2).

Scale reading etc.—Svardson (1); on *Oncorhynchus*, Hayashi; use of otoliths in *Clupea* racial studies, Bückmann & others; use of otoliths for age determination of *Sardinops*, Mosher;

validity of *Melanogrammus* otolith age determinations, Kohler; *Melanogrammus* otolith—scale comparisons, Kohler & Clark; otolith size/total length relationship in *Astroconger*, Okada & Suzuki (3); interpretation of *Sebastes* otoliths, Bratberg; annual rings on *Clupea* scales, Muzinic & Richardson; use of scales for age determination in *Engraulis*, Hayashi & Kondo; estimation of growth from *Salmo* scales, Hartley (1); collection and interpretation of *Oncorhynchus* scales, Clutter & Whitesel; validity of age determination from scales of *Salvelinus*, Cable; use of *Rutilus* scales for age determination, Balon (1); rings in *Tilapia* scales associated with calcium deficiency at breeding time, Garrod & Newell; growth checks in *Rastrelliger* scales, Seshappa; interpretation of *Aldrichetta* scales, Thomson (2).

Population studies.—Characters used in *Hilsa* study, Pillay (1); stock strength of Atlanto-Scandian *Clupea*, Aasen; studies on *Clupea*, Bückmann & others; Hourston; Rasmussen; Wielinga; *Alosa nordmanni*, Zalevsky; *Plecoglossus*, Kawanabe & others (1) & (2); *Salmo trutta*, Le Cren (2); *Oncorhynchus nerka*, Kubo, T. *Abramis ballerus*, Yurovitsky; *Rutilus* in Poland, Stangenberg; *Gadus*, Jonsson; Otterbech; Portuguese *Gambusia*, Franca, P. da & M. de L. (1); *Eupomotis*, Marchetti; *Roccus*, Raney (2); Raney & Woolcott; Raney & others; *Scomber*, Nedelec; *Germo*, Kurogane & Hiyama (4); *Anoplopoma*, Phillips, J. B. (2); spawning stocks of *Salmo* of a Newfoundland river, Murray; spawning population of *Cyprinus*, Balon (4); geographic variation in *Fundulus nolti*, Brown; population studies off Texas coast, Gunter (2); effect of predators on size of a population, Fortunatova.

Fluctuations of stock.—Uda; of *Sardinops* off Kii Peninsula, Zinziro; of E. Anglian *Clupea*, Hodgson; seasonal fluctuations of *Salmo* in Baltic, Alm; cyclic fluctuations of *Oncorhynchus* in Alaska, Rounsefell (2); fluctuations in Grand Lakes, Vladikov & Beaulieu; factors affecting fluctuations in Port Aransas, Springer & Pirson.

Ecological studies.—On minnows in an intermittent stream, Paloupins (1); on *Acanthocybium*, Iversen & Yoshida; on pelagic fishes of Black Sea, Porumb

I. I. & F. I.; on fauna of Elbe, **Bauch** (3); on Bosna river, Yugoslavia, **Oskar**; on a high altitude Sierra Nevada lake, **Reimers** (2); on Heming Lake, Manitoba, **Lawler & Watson**; on Inhaca Island, **Kalk**.

Ecological surveys.—Population of an Illinois stream, **Lewis, W. M.**; of Deep Creek, Kansas, **Minckley**; of N.S.W. trout waters, **Lake**; marine ecology—general text book, **Moore, H. B.**

Relations with physical environment.—Resistance of young *Oncorhynchus* to low temperatures, **Brett & Alderdice** (2); conditions favourable to tuna, **Lozano Cabo** (1); 'critical period' in early life history of marine fishes, **Marr**; effects of environmental stress on fishes, **Brett** (2); influence on fish behaviour, **Fleming**; preferred temperatures of some lake fishes, **Ferguson**; effects of drought on populations, **Paloumpis** (3); importance of various factors in a sewage effluent and their balance, **Allan & others**; fishes of acid, calcareous and torrential waters in Malaya, **Johnson**; phenological studies on fish, **Ristkok** (2).

Special habitats.—Survey of N. American cave fishes, **Dearolf**; thermal waters harbouring Miocene relicts, ecology of endemic *Scardinius*, **Müller, G. J.**; habitat of *Caecobarbus*, **Heuts & Leleup**; onset of air-breathing in young Anabantidae, **Stolzenhain**; amphibious habits of *Synbranchus*, **Lüling** (4); habitat of *Uegitglanis*, **Thines** (2).

Introduction and acclimatization.—Condition of introduced *Coregonus* in North Finland, **Järvi**; introduction of *Carassius*, *Trichogaster* and *Tilapia* into East Pakistan, **Ahmad** (3); introduction of *Lucioperca* into British waters, **Mansfield**; *Tilapia mossambica*, **Atz** (1); *T. zillii*, **Atz** (3); introduced fishes of Thunder Bay, **Allin**; changes in *Gambusia* acclimatized in Uzbekistan, **Gogol**; acclimatization of *Huro* in Brazil, **Azevedo**; acclimatization of fishes in Russia, **Shkorbatov**; **Skrobov**.

Hibernation and aestivation.—Enstymment of *Protopterus*, **Marlier** (1).

Food and feeding habits.—Of Senegalese Euselachii, **Cadenat** (2); some Central Pacific selachians, **Strasburg** (2); *Salvelinus*, **Desmarais**; *Leucichthys*, **Bersamin**; *Scardinius*, **Čihař & Frank**;

Carassius in Central Bohemia, **Čihar** (3); *Rutilus*, **Hruška**; species of *Puntius*, *Callichrous* and *Glossogobius*, **Moitra** (2); *Rutilus* and *Chondrostoma* in Polish waters, **Paschalski**; *Clupisoma* and *Eutropiichthys*, **Motwani & Karamchandani**; *Aristichthys* and *Hypophthalmichthys*, **Nie & Chiang**; *Anguilla*, **Godfrey** (1); **Kublickas**; *Betta* in Malaya, **Alfred**; *Gadus* in Eastern Murman, **Zhabreva**; *Zeus* in aquaria, **Wilson**; *Vimba*, **Munteanu**; *Steatocranus*, **Wickler** (4); *Seriola*, **Hatanaka & others** (2); **Mitani** (1); *Scomber*, **Nalbandoglu**; Scombrids, **Ronquillo**; Moroccan Scorpaenids, **Boutière**; *Synbranchus*, **Lüling** (4); freshwater Madras fishes, **Menon & Chacko** (1) & (2); feeding habits of young *Ctenopharyngodon* and *Hypophthalmichthys*, **Inaba & Nomura**; *Mormyrus kannume*, **Macdonald**; *Mugil* in Turkish waters, **Denizci**; *Cynoglossus lingua*, **Kuthalingam**; some Louisiana fishes, **Darnell**; fishes in Dzhezkazgansk reservoir, **Malinorskaya**; some larval fishes, **Sato, R.**; factors affecting feeding behaviour of *Clupea*, **Blaxter & Holliday** (2); diurnal rhythm of feeding of *Carassius*, **Hirata**; **Hirata & Kobayashi**; feeding coefficient of *Lucioperca*, **Biely** (1); spitting behaviour of *Toxotes*, **Lüling** (5); adaptability when deprived of usual food, **Corbet** (1); relation between mouth size and food size in *Salmo*, **Hartman**; swallowing of food by *Esox*, **Kuzmenko**; food of *Squalus*, **Ionescu & Serpoianu**; young *Clupea*, **Matveeva, R. P.**; *Ethmalosa*, **Bainbridge, V.**; *Salmo trutta*, **Stinson**; *Dallia*, **Nardone**; *Clinostomus*, **Schwartz & Norvell**; *Chondrostoma nasus* in Czechoslovakia, **Vejmola**; *Scardinius racovitzai*, **Müller, G. T.**; *Ameiurus*, **Frank** (1); *Vimba* and *Chalcalburnus*, **Kasumov**; *Esox*, **Čihař** (1); *Gadus*, **Powles**; *Acanthocybium solandri*, **Iversen & Yoshida**; young *Pneumatophorus*, **Hatanaka & others** (1); *Makaira*, **Krumholz & DeSylva**; *Centronotus*, **Qasim** (2); Nile fishes, **Sandon & Tayib**; some W. African estuarine fishes, **Longhurst** (1); stomach contents of *Cetorhinus*, **Loas**; *Clupea* feeding on *Calanus*, **Gerasimov**; *Salmo* feeding on *Belone*, **Eaton**; cannibalism in *Gambusia*, **Abdullayev**; *Tetraodon* biting fins of other fishes, **Ostermüller** (1); utilization of *Dorosoma* by game fishes, **Kutkuhn**; microorganisms as food of young fish, **Assman** (2); fishes as predators of

birds, **Pitman**; feeding on gastropods by removing from shell, **Lüling** (1); fishes feeding on Cirripedia, **Tarasov**; feeding on ectoparasites of other fishes, **Randall** (3); utilization of plankton, **Hiyama & Yasuda**; **Yasuda & Hiyama**; algal feeding, **Martin, M. & Winks**.

Migrations and movements.—Of *Salmo trutta*, **Stuart** (2); Bear Island *Gadus*, **Trout** (1); *Micropogon*, **Suttks** (1); *Scomber*, **Demir & Acara**; *Germo* in northwest Pacific, **Inoue**; *Sarda*, **Demir**; *Sarda* related to temperature, **Acara** (2); *Thunnus thynnus*, **Smith, F. G. W.**; some Turkish Scombrids, **Nümann**; polarization of light as possible factor controlling movements and migrations, **Waterman**; **Waterman & Westell**; migrations of *Alosa*, **Talbot & Sykes**; *Passamaquoddy Clupea*, **McKenzie & Skud**; long distance migration of *Salmo*, **Menzies & Shearer**; feeding migrations of *Thyrstites*, **Blackburn**; spawning migrations of Fraser river *Oncorhynchus*, **Killick**; **Krykhtin**; **Skud**; factors affecting seaward migration of *Oncorhynchus*, **Kobayashi, T.**; seaward breeding migration of *Mugil*, **Jhingran**; spawning migration of *Pelecus*, **Kaj** (1); *Vimba*, **Zhukovski**; *Gasterosteus*, **Baggerman**; factors affecting migration in Danube, **Bacesco & Dumitresco**; perception of pathways during migration, **Hasler**; return to release point of *Oncorhynchus*, **Donaldson & Allen**; homing behaviour of *Clinocottus* and *Girella*, **Williams, G. C.**; *Clupea* movements in relation to tidal currents, **Jones, F. R. H.**; movement of *Salmo* on river Erne, **Jackson, P. A.**; *Salmo* around Ireland, **Went** (2); *Salmo* in the Tweed, **Nall**; tagged *Salmo*, **Pyefinch & Shearer**; *Salvelinus* in fresh and salt water, **Smith H. W. & Saunders**; *Anguilla* movements in North Sea, **Lühmann & Mann** (2); *Anguilla japonica* in Fukue Bay, Japan, **Kasahara**; *Eopsetta*, **Alverson & Chatwin**; effect of wind and current on movements of larval *Gadus*, **Hill & Lee**; movements of tagged examples, **Shearer**; Estuarine fish invading the Albert River, Australia, **Thomson** (4); vertical movements of *Engraulis japonicus*, **Inoue & Ogura** (1); rapid learning of a constant course, **Hoar** (2).

Behaviour.—Of *Mustelus* and *Torpedo* under influence of histamine and

antihistamine, **Jullien & others**; evolution of migratory habits in young *Oncorhynchus*, **Hoar** (3); behaviour of *Xiphophorus*, **Wickler** (2); behaviour patterns of some Cichlids, **Oehlert**.

Social behaviour.—Of *Gobius*, **Bopp**; territorial and spawning behaviour of *Blennius*, **Wickler** (3); territorial behaviour in *Tetraodon*, **Lüling** (1); territorial behaviour in an aquarium, **Barrow**; schooling behaviour of a restricted age-group in *Synodontis*, **Pinter** (3); schooling habits of *Pomolobus*, **Graham, J. F. G.**; *Neothunnus* and *Katsuwonus*, **Orange & others**; jumping of *Engraulis* shoals, **Inoue & Ogura** (2); competition between young *Salmo salar* and *S. trutta*, **Kalleberg**; effect of ergot drugs on *Betta*, **Evans & others** (1); threat display in *Tetraodon*, **Lüling** (1); colour change related to dominance in *Stephanolepis*, **Okaichi & others**.

Relations with other organisms.—**Martino & Karapetkova**; with corals **Klauswitz** (4); larval fishes found with floating algae, **Uchida & Shojima**; Labrids feeding on ectoparasites of other fishes, **Randall** (3); symbiosis of *Amphiprion* with *Stoichactis*, **Davenport & Norris**; *Cryptocentrus* and the crayfish *Alpheus*, **Luther**; *Obortiphagus* and a prawn, **Smith, J. L. B.** (19); behaviour of *Carapus* towards holothurian host, **Arnold**.

Cryptic and Mimetic Colouration.—Disruptive colour in *Plectorhynchus*, **Atz** (2); mimetism and ecology in Scorpaenidae, **Boutière**; Müllerian mimicry in *Sufflamen* and *Acanthurus*, **Tor-tonese** (3).

Ecdysis.—in Japanese fishes, **Hirosaki**.

Methods of defence and offence.—Sound production by *Botia* as defence weapon, **Klauswitz** (6); spines of *Gasterosteus* as means of defence, **Hoogland & others**.

Enemies.—The squid, *Dosidiscus*, feeding on *Engraulis* and *Merluccius*, **Buen** (1); Grackles (*Quiscalus*) feeding on *Notropis*, **Follett** (1).

Diseases and parasites.—Fish diseases, **Lyaiman**; **Petmoshevski**; fish diseases in Soviet Union and their control, **Bauer, O.**; new methods of control, **Bauer & Uspenskaya**; study of ichthyophthirius, **Bauer, O. N.** (2); study of infectious dropsy, **Dinu**; Polish method of

fighting dropsy, **Kocylowski**; clinical study of hydropsy, **Nicolau & others**; effect of tympanitis on internal organs, **Wunder** (4); a bacterium causing tail rot, **Oppenheimer**, C. H.; revised treatment of furunculosis, **Snieszko & Bullock**; air bubble disease of *Salmo*, **Rukavina & Varenika**; bacterial disease of *Salmo*, **Hoshina** (1) & (2); cause of vibrio-disease in *Salmo*, **Hoshina** (3); control of vibrio disease in *Salmo* **Hoshina & others**; virus disease in *Salmo*, **Deufel**; streptococcal disease of *Salmo*, **Hoshina & others**; gill blight in *Coregonus albula*, **Huculak**; fungi disease of *Anguilla*, **Hoshina & Ookubo**; effects of *Saprolegnia* attack on *Gambusia*, **Remotti**; effect of heavy parasitization on activity, **Silliman**; parasites of fishes of Greifswald area, **Engelbrecht**; effect of *Petromyzon* on host fish, **Parker & Lennon**; parasites of *Clupea*, **Dollfus** (2); heavy infestation of *Clupea* by a Copepod, **Harding & Wheeler**; parasites of *Sardina* and *Engraulis*, **Reichenbach-Klinke** (2); parasitising of *Sardina* by *Peroderma*, **Larrañeta** (1); fatal infestation of *Coregonus*, **Radulescu & others**; parasitising of *Platyopocilus* by *Saprolegniaceae*, **Vishinac & Nigrelli**; investigation of liver ascites in *Cyprinus*, **Amlacher**; Trematoda in *Monocirrhus*, **Geus**; parasites of *Acanthocybium solandri*, **Iversen & Yoshida**; plerocercoid larvae in *Hippoglossus*, **Rae**.

Mortality.—In a Madurai tank, **Krishnamurthi & others**; intestinal flukes as cause of mortality, **Wales**; toxicity of dinoflagellate, *Gymnodinium*, **Ray & Wilson**; mortality rate of *Engraulis* in Azov Sea, **Salnikov**; natural mortality rate of *Gadus aeglefinus*, **Taylor** (1); mortality of *Anguilla* through *Argulus* parasitization, **Soika**; of *Cyprinodon* from high salinity, **Barlow**.

Sounds emitted by fishes.—**Moulton** (2); influencing calling of *Prionotus* with sound, **Moulton** (1); two different calls made by *Prionotus*, **Moulton** (3); significance of in *Bathygobius*, **Tavolga** (3); sounds produced by *Opsanus*, **Tavolga** (1).

DISTRIBUTION

a. GENERAL

Original environment of craniates, **White** (2); geological environment of

fossil fishes, **Rayner**; zoogeography (refs. to fishes), **Darlington**; Scandinavian relict populations, **Svårdson** (3); history of ichthyofauna of Kama river basin, **Bukirev & Ussoltsev**; size distribution in a Texas estuary, **Reid, G. K. & Hoese**.

b. MARINE

General.—Fish remains from shell-mound in California, **Follett** (2); fish remains from aboriginal sites at Sonora, **Follett** (3); distribution and climatic trends, **Taylor, C. C. & others**; comparison of Black Sea and Mediterranean fauna, **Svetovidov** (3); distribution of Japanese bottom fishes, **Okada**; vertical distribution of some Japanese fishes, **Kanda**; vertical distribution of *Parathunnus*, *Neothunnus* and *Makaira*, **Nakagome** (2); distribution of *Sardina* eggs in Adriatic, **Gamulin & Karlovac**; distribution of eggs and larvae in Kuroshio area, **Hattori, Watanabe & Okutani**.

Arctic.—Wrangel Island, **Andriyashev** (2).

North temperate and sub-arctic.—USSR, **Andriyashev** (1); Kurile-Kamchatka trench, **Andriyashev** (3); Dorset, **Dalton** (1); Devon, **Corbin**; Ireland, **Kennedy, M.**; North Sea, **Ancellin**; Roscoff, **Anon** (1); Black Sea, **Slastenenko** (1); Malta, **Lanfranco**; Algerian coast, **Dieuzeide & Roland** (1) & (2); Morocco, **Dollfus**; Furnestin & others; Spain and Morocco, **Lozano Cabo** (3); Mediterranean, **Rossi**; Tortonese (9); Taranto Sea, **Parenzan** (1); Gulf of Genoa, **Tortonese** (10); Ligurian Sea, **Torchio** (1) & (2); North Atlantic, **Koefoed**; Western Atlantic, **Berry & Rathjen**; Western North Atlantic, **Berry** (3); Cohen, D. M. (1); Mead (2); Scattergood; Providence Bay, **Barsukov**; Texas, **Hoese**; Springer & Hoese; Florida, **Briggs**; Caldwell (2); Osburn & Mowbray; Robins & Courtenay; Robins & Manning; California, **Bradbury & Cohen**; Hemphill & Follett; Houck; Phillips, J. B. (1); Baja, California, **Craig**; Hubbs & Rechnitzer; Gulf of Alaska, **Aron & McCrery** (2); North Pacific, **Aron & McCrery** (1); Birman; Cohen, D. M. (4) & (5); Hikita (1); Sagami Bay, **Abe**; Japan, **Asano** (1) & (2); Honma (1); Ishiyama (2); Kamohara (1)—(4); Kanazawa (2); Katayama (1) & (2); Kuroda (2); Matsubara & Iwai (1); Okada & Kubota (2); Okada

& Mori (1) & (2); Okuno & others; Takagi; Tomiyama; Tomiyama & Abe; South China Sea, Chu & Cheng; Szechung; Taipei, Chu & Chen; Taiwan, Chu & Tsai.

Tropical.—Trinidad, Robins (2); Bahamas, Mead & Böhlke; Cuba, Rivero; Schultz, L. P. (3); Caribbean Sea, Klauswitz (5); Robins (1); Gulf of Mexico, Berry (2); Bigelow & Schroeder (1); Cohen, D. M. (2); Grey (2); Mead (1); Schultz, L. P. (3); Springer, V. G. Woods; Costa Rica, Caldwell (4); British Guiana, McConnell; French Guiana, Schultz, L. P. (3); Venezuela, Martin, S. F. (1), (2), (3); Brazil, Carvalho J. de P. (1), (2); Kanazawa (2); Peru, Morrow (1) & (2); South Atlantic, Nybelin & Poll; Eritrea, Tortonese (5); Arabian Sea, Chandy (1); Red Sea, Schultz, L. P. (1); West Africa, Cadenat (1); Cohen, D. M. (2); Senegal, Cadenat (3); Puyo; Gold Coast, Salzen; French Equatorial Africa, Collignol & others; Angola, Franca; E. Africa, Smith, J. L. B. (2); Western Indian Ocean, Smith, J. L. B. (3), (4), (5) & (8); Mozambique, Smith, J. L. B. (11), (19) & (20); Zanzibar, Smith, J. L. B. (6), (7); Williams, F.; Aldabra, Arnoult & others; Smith, J. L. B. (8) & (9); Seychelles, Smith, J. L. B. (5); India, Chandy (2); Bombay, Bal & Mohamed; Jaffna, Silva (1); Malabar coast, Chacko & Mathew; Ceylon, Silva (2) & (3); Laccadive Isl., Balan; Maldiva Isl., Palmer; Vietnam, Dao Van Tien; Dutch East Indies, Chabanaud (1); Celebes, Schultz, L. P. (1); New Guinea, Munro, I. S. R. (2); Whitley (9); Philippines, Kanazawa (2); Schultz, L. P. (1); New Hebrides, Whitley (3); New Caledonia, Whitley (2); Rennell Isl., Rofen; Onotoa Atoll, Schultz, L. P. (1); Pacific islands, Randall (3); Central Pacific, Gosline; Eastern Pacific, Bertelsen & Marshall; Rehnitz & Böhlke; Rosenblatt & Baldwin; Hawaii, Kanazawa (2); Randall (2); Galapagos Islands, Hubbs, C. L. (2); Klauswitz (5).

South temperate.—South Africa, Smith, J. L. B. (12) & (14); Natal, Smith, J. L. B. (18); Algoa Bay, Smith, J. L. B. (10) & (11); Chile, Buen (4) & (5); Easter Isl., Chile, Wilhelm & Hulot; Kerguelen Isl., Blanc; Australia, Cowper; Munro, I. S. R. (1); W. Australia, Milward; Whitley (5); New South

Wales, Cohen, D. M. (2); Smith, J. L. B. (1); Whitley (2); New Zealand, Richardson; Tasmania, Olsen; Auckland and Campbell IIs., Parrott.

C. FRESHWATER

General.—Changes in Ontario fish fauna, Scott, W. B. (1); fishes of Canadian water basins, Slastenenko (2); effect of Pleistocene glaciation on fish distribution in Minnesota, Underhill; fish remains from an Illinois Cahokia site, Parmalec; scales from sediment core in Connecticut, Lagler & Vallen-tyne; distribution of African fishes, Poll (1); geological barriers in West Africa, Stenholt-Clausen; zoogeography of some S. African fishes, Jubb (3); relationships of Indian fishes, Menon, A. G. K. (2); Isospondylous fishes in Chinese waters, Tchang; origin of fishes in Japanese sea basin, Lindbergh (1); reconstruction of fish fauna in Russian lakes, Dryagin.

Palaeartic.—Lake District, Frost & Le Cren; London, Wheeler (2); Dorset, Dalton (2); Europe, Zanandrea (6); France, Arnoult; Italy, Tortonese (1); Zanandrea (1); Holland, Reichenbach-Klinke (1); Danube, Zanandrea (2); Austria, Bauer, K.; Poland, Dyszewska & Markiewicz; N. E. Slovakia, Kux & Weisz; S. Slovakia, Kux; Central Carpathia, Dudich; Roumania, Banarescu (1) & (2); Dumitrescu & others; Müller, G. J.; Moravia, Dyk (3); Serbia, Brankovic; Estonia, Riskok; Black Sea, Kux & Libosvarsky; Azov Sea, Slastenenko (1); Lake Baikal, Taliev; Lake Chelkar, Serov (2); Gruzia, Russia, Elanidge; Belorussia, Zhukan; Zhukov; Turcomania, Nikol-sky (1); Nikolski & Tzentilovich; Russia, Goryunova (1); Putyatinsk Island, Novikov; Japan, Honma (1); Okada & Kubota (1); Shimokita Peninsula, Nakamura, M. & Kawai (1); Formosa Nichols.

Nearctic.—Canada and Alaska (check list), Scott, W. B. (2); Canada, Slastenenko (3); Manitoba, Keleher & Kooymann; United States, Hubbs, Clark (3); Moore; Montana, Brunson & Block; Kansas, Clarke, Breukelman & Andrews; Cross & Minckley; Fitch; Greer & Cross; Texas, Hubbs, Clark (4); Louisiana, Hancock & Sublette; Illinois, Gibbs, R. H. (2); Gunning & Lewis (1) & (2); Florida, Harrington & Rivas.

Central Mexico.—Northeastern Mexico, Hubbs & Hubbs; Cuba, Duarte-Bello & Suarez-Caabro; Rivas; Antilles, Hoedeman (3); El Salvador, Boeseman; Costa Rica, Böhlke (4).

South America.—British Guiana, McConnell; Schultz & Axelrod; Venezuela, Fernandez & Martin; Ramirez, E.; Colombia, Dahl; Ecuador, Böhlke (3); Kanazawa (1); Brazil, Gomes & Schubart; Travassos (1), (2) & (3); N. W. Brazil, Travassos, L. & H.; nr. Rio de Janeiro, Ladiges (2); Peru, Böhlke (2); Chile, Buen (3).

Ethiopian.—French Guinea, Géry; Lambert; West Africa, Daget (2); Haute-Volta, Fr. West Africa, Daget (6); Eritrea, Menon, A. G. K. (3); Belgian Congo, Poll (2); Poll & Lambert; Lake Tumba, Belgian Congo, Marlier (3); Middle Congo, Roux; Uganda, Greenwood (1); Lake Victoria, Greenwood (2); Kenya, Whitehead (1); Transvaal, Groenewald; Barotseland, Jubb (2).

Oriental.—Pakistan, Sufi (1); East Pakistan, Ahmad (1); Peninsular India, Silas (1); Kolhapur District, India, Kalawar & Kelkar; Manipur State, India, Menon, A. G. K. (1); Delhi, Mazumdar, N. N.; Jaffna, Silva; Sone river, India, Motwani & David; Malabar, Silas (2); Assam, Sehgal; Chilka Lake, Roy, J. C. & Sahoo; Thailand, Meinken (2) & (5); Malaya, Johnson; Borneo, Inger; Whitley (2).

Australian region and Polynesia.—New Guinea, Brongersma; Whitley (4); Rennell Island, Bruun & Nielsen.

d. FOSSIL

General.—Bernhauser; text-book, Berg (2); origin of vertebrates, Piveteau; original environment of Craniates, White (2); Quaternary environments in E. and S. Africa, Cooke; environment of fossil fishes, Rayner; origin of continental faunas, Westoll (1); fossil fishes of Florida, Ray, C. E.; review of Australian fossil fishes, Hells; body-fins and mode of life of earliest vertebrates, Obruchev (1); fin-fold theory, Westoll (2); teeth and hard tissues, Ørvig (1); sharks' teeth, Kruckow (1).

Palaeozoic.—Of U.S.S.R., Obruchev (2); Ordovician, Ørvig (2); Sinclair; Silurian, Gross (1) & (2); Heintz (2); Parrington; Squirrell; Devonian, Deni-

son; Gross (1) & (3); Heintz (1); Jarvik; Karatajue; Karatayute; Liu & P'au; Schmidt, W.; Stensiö; Tarlo; Wattison; White (1); Carboniferous, Berg (1); Matveeva, A. A.; Vangerow.

Permian.—Heyler; Miller & Mann; Romer (1); Theobald.

Mesozoic.—Trias, Beltan (1); Rusconi.

Triassic.—Chou & Liu; Liu.

Jurassic.—Battaler; Beltan (2); Griffith; Guérin; Nybelin (2); Cretaceous, Casier; Dunkle; Eristavi; Hantke; Miller, H. W. (1) & (2); Rebouças & Santos; Sacchi Vialli.

Tertiary.—Casier; Danil'chenko; Jermańska (2); Tavani. Eocene, Frizzell & Exline; Oligocene, Jonet; Peyer; Rothausen; Stinton; Weiler (1); Miocene, Jerzmanska (1); Kharatishvili; Kruckow (1) & (2); Leriche; Paucá; Pobedina; Pobedina & others; Stinton; Tarashchuk; Weiler (1); (2); Zbyszewski; Pliocene, Bauzá Rullán (1) & (2); Caldwell (3); Leriche; Ozaki; Sarma; Stinton.

Quaternary.—Ghelardoni; Shikama & Okafuji; Neolithic, Daget (4); Pleistocene, Brunner; Hooijer; Lindbergh (2) Smith, C. L.

III.—SYSTEMATIC INDEX

GENERAL

Classification.—Systematics and modern ichthyology, Klauswitz (1); description and use of otoliths in taxonomy of Hungarian fishes, Berinkey.

Nomenclature.—Fowler (1); redundancy of some new names proposed by G. P. Whitley, Trewavas (1); some terms used for higher categories, Myers (2); 'first reviser' selections, Bailey, R. M. (1); authorship of portions of Hist. nat. Poissons, Cuv. & Val. Bailey, R. M. (2); authorship of some Indian fish names, Jones, S.; proposed suppression of *Acinacea* Bory de St. Vincent, Tucker (1); discussion of *Microstoma microstoma*, Cohen, D. M. (3); ruling as to type species of *Bathylagus*, Follett & Cohen; type species of *Cutter* and *Nasus*, Opinion 513; ruling relating to *Conger* and *Cottus*, Direction 87; relative priority of *Cheirodon axelrodi* and *Hyphessobrycon cardinalis*, Opinion 485.

Faunistic works.—Keys to some British shore fishes, **Barrett & Yonge**; freshwater fishes of Canada, **Slattenenko** (3); freshwater fishes of U.S.A., with keys, **Moore**; keys to Californian Scorpaenids, **Phillips, J. B.** (1); fishes of Ohio, **Trautman**; marine fishes of Venezuela, **Martin, S. F.** (1); keys to genera of African freshwater fishes, **Poll** (1); Uganda freshwater fishes (with keys), **Greenwood** (1); marine fishes of French Equatorial Africa, **Collignon & others**; marine fishes of Rennell Isl., **Rofen**; keys to Elasmobranchs and Holocephali of Mie Prefecture, **Okada & Mori** (1); Blennioid fishes of China, **Fowler** (2); fishes of Black Sea and Azov Sea, **Slattenenko** (1); fishes of Northern seas of U.S.S.R. (with keys), **Andriyashev** (1); Cretaceous and Cainozoic faunas of Angola and Cabinda, **Casier**; Burdigalian of Lisbon, **Zbyszewski**.

Vernacular names.—Of U.S. commercial fishes, **Anderson & Power**; fishes of Easter Isl., Chile, **Wilhelm & Hulot**; some W. African fishes, **Paraiso**; Mauritius fishes, **Baissac**; Russian fishes, **Andriyashev** (1).

MARSIPOBRANCHII

Classification and anatomy of fossil Agnatha, **Stensiö**.

†HETEROSTRACI

General review, **Stensiö**.

Aequiarchegonaspis gen. nov. type *Cyathaspis schmidtii* Geinitz **Stensiö** p. 311 text fig. 174; *Seretaspis* gen. nov. type *S. zychi* sp. nov. Downtonian Podolia, **Stensiö** p. 381 text fig. 204.

Astraspis sp. recorded from Ordovician of Canada, **Sinclair**.

Brotzenaspis gen. nov. type *B. pteraspidoidea* sp. nov. Downtonian Podolia p. 277 text fig. 152B.

Fraenkelpis gen. nov. type *Anglaspis heintzi* Kiaer, **Stensiö** p. 296 text fig. 166

Lauaspis gen. nov. type *Archegonaspis lindströmi* Kiaer, **Stensiö** p. 306 text fig. 172.

Mylopteraspis gen. nov. type *M. gracilis* sp. nov. p. 259 text fig. 139; *M. robusta* sp. nov. p. 263 text figs. 142, 156; Dittonian Podolia, **Stensiö**.

Parapteraspis gen. nov. type *P. gracilis* sp. nov. Dittonian Podolia p. 280 text figs. 153; *Pteraspis folana* Brotzen referred, **Stensiö**.

Penygaspis gen. nov. type *Pteraspis dixonii* White, **Stensiö** p. 292 text fig. 147C-F.

Plesiopteraspis gen. nov. type *P. depressa* sp. nov. p. 256 text figs. 137, 153, 146; *P. lata* sp. nov. p. 257 text fig. 138; Downtonian Podolia, **Stensiö**.

Psammolepis paradoxa dorsal shield figd., **Heintz** (1).

Pseudopteraspis, gen. nov. type *P. kujdanowiensis* sp. nov. p. 254 text figs. 136; *P. zychi* sp. nov. p. 259 text figs. 140, 191; *P. spathulirostris* sp. nov. p. 337 text fig. 181; *P. elongata* figd., all Dittonian Podolia, **Stensiö**.

Pteraspis rec. from Taunus, **Schmidt, W.**; *P. dobrowlanyensis* p. 276 text fig. 151; *P. brotzeni* p. 275 text fig. 150; *P. althi* p. 277 text fig. 152, spp. nov. Downtonian Podolia, **Stensiö**; *P. dunensis* pre-oral region, **Tarlo**.

Pycnaspis gen. nov. type *P. splendens* sp. nov. Upper Ordovician U.S.A., **Ørvig** (2) p. 7 text figs. 2, 3 pl. i.

Simopteraspis primaeva figd., **Stensiö**.

Zascinaspis gen. nov. type *Z. obtusirostrata* sp. nov. Dittonian Podolia, **Stensiö** p. 339 text fig. 189.

†THELODONTI

Denticles recorded from Silurian, **Squirrel**.

†OSTEOSTRACI

General review.—*Orthobranchiata*, *Oligobranchiata*, *Nectaspiiformes* ord. nov.; *Mimetaspis* gen. nov. type *Cephalaspis hoeli* **Stensiö** p. 213; *Pattenaspis* gen. nov. type *Cephalaspis whitei* **Stensiö** p. 216, **Stensiö**.

Internal anatomy of cephalic shield of *Zenaspis Tremataspis*, *Darmuthia*, *Procephalaspis Witaaspis*, *Nectaspis*, **Stensiö**.

Cephalaspis lyelli type re-descr. & figd., **White** (1).

†ANASPIDA

General review, **Stensiö**; **Parrington**.

Scales of gen. indet. from the Beyrichienkalk descr. & figd.; **Gross** (2)

Scales of *Saarolepis oeselensis* figd., Gross (2).

Birkenia elegans, head descr. & figd., Heintz (2).

Lasanius and *Birkenia* figd., Parrington.

CYCLOSTOMATA PETROMYZONIDAE

Of Italy, *Zanandrea* (1); experiments on fertilisation, Rothschild.

Ammocoetes cibarius Girard a synonym of *Entosphenus tridentatus* (Richardson), Vladkov & Follett.

Caspiomyzon wagneri receptor neurones of digestive system, Milochin (1).

Eudontomyzon danfordi distribution and biology of Austrian specimens, *Zanandrea* (5); habits and occurrence in Danube system, *Zanandrea* (2).

Lampetra, degrees of neoteny, endocrinology *Zanandrea* (3); spinal cord ganglion cells, Johnels (3); *L. ayresii* redescribed, a valid species, Vladkov & Follett; *L. fluviatilis* winter and spring races, Erik; cytology of spermatogenesis, Chubareva (2); breeding habits and early development, Bahr; innervation of enteron, Johnels & Östlund; osmoregulation, Morris; respiratory function of blood, Pavlov & Skirstymonskaja-Krolik; *L. planeri* observations on distribution, Baxter; early segmentation of egg, Veit; larval growth, Balon (5); adrenal and interrenal system, Sterba (1); electrophoretic behaviour of haemoglobin, Adinolfi & Chieffi; *L. planeri*, *fluviatilis*, *zanandreae*, differential characters, distribution, *Zanandrea* (6); *L. planeri zanandreae*, *L. aepyptera* relationships, *Zanandrea* (4); *L. reissneri*, *L. japonica japonica* polysaccharide test on alveoli of eggs, Kusa; *L. zanandreae* capture and growth in aquarium, *Zanandrea* (7).

Petromyzon development of eye, Lebkova; formation of melanoblasts in larvae, Danneel; *P. marinus* anatomy, development of buccal glands, Gibbs, S. P.; branchial basket, Richey; from the Elbe, Oliva (3); from Tunisian waters, Heldt (2); study of behaviour during parasitic phase, Parker & Lennon.

MYXINIDAE

Myxine nerve plexus control of gall bladder, Fänge & Johnels; *M. glutinosa*

occurrence in Mediterranean, Dieuzeide (2); taken off Iceland, Konstantusov & Shchegolev; respiration, Strahan; cardiac plexus of vagus intestinalis, Johnels (2); structure of pancreas-like organ, Schreiner.

Nemamyxine elongata gen. et sp. nov. New Zealand, Richardson, p. 284 figd..

Polistotrema stouti osmotic properties, McFarland & Munz.

†PLACODERMI

ACANTHODII

Denticles recorded Upper Silurian, Squirrel.

Acanthodes, tail figd. Permian France, Heyler; *A. lopatini* descr., Berg (1).

ARTHRODIRA

Comparative morphology of arctolepids, Denison.

Aethaspis gen. nov. type *A. major* sp. nov. Devonian Utah, p. 474 figs. 89, 92, 93, 95, 97-99; *A. utahensis* sp. nov. p. 475 figs. 90, 91, 94, 96 Devonian Utah, Denison.

Euryaspidichthys nom. nov. for *Euryaspis* Bryant 1932 pre-occ., Whitley (1) p. 44.

Grazosteus gen. nov. type *G. hoernesii* sp. nov. Devonian Austria, Gross (3) p. 139 text figs. 1-3.

Radotina referred to Rhenanida; *R. tessellata* p. 14 text figs. 3-5 pl. ii figs. 3, 4, pl. iii figs. 1-4; *R. tuberculata* p. 21 text fig 6A pl. i fig. 3, spp. nov. L. Devonian Bohemia; *R. kosorensis* descr. & figd.; R. sp. rec. L. Devonian Rhineland, Gross (1).

Ringinia nom. nov. for *Rhynchognathus* Jaekel 1929 pre-occ., Whitley (1) p. 44.

Simblaspis gen. nov. type *S. cachensis* Devonian Utah, Denison p. 467 figs. 86, 87, 88.

ANTIARCHA

Asterolepis ornata figd., Karatajue; *A. ornata* ventral armour figd., Karatajue.

Sinolepis gen. nov. type *S. macrocephala* sp. nov. p. 8 (English p. 27) text figs. 5, 7, 8 pls i-ix; *S. wutungensis* sp. nov. p. 19 (39) pl. iv fig. 2, Devonian China, Liu & P'an.

SELACHII

EUSELACHII

Distribution in relation to annual isotherms, **Misra**.

Key to Chilean families, **Buen** (4).

PLEUROTREMATA

Food of Senegalese species, **Cadenat** (2).

HEXANCHIDAE

Hepranchias perlo from Rio Grande do Sul, **Barcellos** (1).

Notidanus †lanceolatus rec. from Russia, **Eristavi**; *N. †microdon* figd. from Brazil, **Rebouças & Santos**; *N. †primigenius* teeth figd. Neogene France, **Leriche**.

ODONTASPIDAE

Carcharias (Odontaspis) taurus bio-nomics, **Cadenat** (1).

Odontaspis †acutissima, *O. cuspidata* teeth figd. Neogene France, **Leriche**; *O. (Synodontaspis) †acutissima* figd. Oligocene Roumania, **Jonet**; *O. (Carcharias) ferox* teeth Quaternary Italy figd., **Ghelardoni**; *O. †tingitana* figd. from Brazil, **Rebouças & Santos**.

Scapanorhynchus †rapax figd. from Brazil, **Rebouças & Santos**.

LAMNIDAE

Alopias pelagicus, *A. superciliosus*, *A. vulpinus* distribution, food, **Strasburg** (2); *A. superciliosus* new W. African record, **Cadenat** (1); *A. vulpinus* from Rio Grande do Sul, **Barcellos** (2).

Carcharodon †angustidens, *C. †megalon* teeth figd. Miocene France, **Leriche**; *C. carcharias* a large example from Massachusetts Bay, **Bigelow & Schroeder** (2); from Tunisian waters, **Postel** (2); teeth Quaternary Italy figd., **Ghelardoni**; *C. cf. †praemegalon* tooth figd., **Rothausen**.

Cetorhinus maximus Chilean records, **Buen** (4); stomach contents, **Loas**; *C. †parvus* figd. Oligocene Roumania, **Jonet**.

Isurus key to species, **Smith, J. L. B.** (16); *I. glaucus* distribution, food, **Strasburg** (2); *I. †hastalis* tooth figd., **Rothausen**; *I. oxyrhynchus* teeth Quaternary Italy figd., **Ghelardoni**.

Lamna cornubica occurrence on west coast of Ireland, **Kennedy, M.**; *L. ditropis* distribution, food, **Strasburg** (2);

L. †serrata, *†Squalicorax kaupi*, *S. pristodontus* figd. from Brazil, **Rebouças & Santos**.

Oxyrhina †desori, *O. †hastalis*, *O. †retroflexa* figd. Neogene France, **Leriche**.

ORECTOLOBIDAE

Chiloscyllium indicum Gmelin's type redescribed, **Wheeler** (1).

Parascyllum ferrugineus new Tasmanian record, **Olsen**.

RHINCODONTIDAE

Rhincodon typus Chilean records, **Buen** (4).

SCYLIORHINIDAE

Halaelurus vincenti new Tasmanian record, **Olsen**.

Scyliorhinus canicula structure of shell gland, **Threadgold**; anatomical & histological characters of the Müllerian ducts during growth and ovulation, **Gastaud** (2).

CARCHARINIDAE

Aprionodon† cf. *collata* teeth figd. Neogene France, **Leriche**;

Carcharhinus key to Eastern Pacific species, **Rosenblatt & Baldwin**; *C. cf. acutus* tooth figd. Cretaceous Italy, **Sacchi Vialli**; *C. galapagensis* new record for Clipperton Island, **Rosenblatt & Baldwin**; *C. limbatus* new Galapagos Islands record, **Rosenblatt & Baldwin**; *C. malpeloensis*, *C. remotus* redescribed, **Rosenblatt & Baldwin**; *C. melanopterus* development, **Melonk**; distribution, food, **Strasburg** (2); *C. porosus* recorded from San Felipe, **Rosenblatt & Baldwin**; *C. vanrooyeni* sp. nov. Natal, **Smith, J. L. B.** (18) p. 12 figd.

Eulamia floridanus distribution, food, **Strasburg** (2).

Galeocerdo †aduncus teeth figd. Neogene France, **Leriche**.

Galeorhinus key to species, **Smith, J. L. B.** (7); *G. australis* Macleay a synonym of *G. galeus*, **Smith, J. L. B.** (7); *G. galeus* teeth Quaternary Italy figd., **Ghelardoni**; *G. (Hypogaleus) zanzibarensis* subgen. et sp. nov. Zanzibar, **Smith, J. L. B.** (7) p. 589 figd.; *G. zyopterus* distribution, food, **Strasburg** (2).

Hemipristis elongatus recorded from Zanzibar and Mozambique, with description, **Smith, J. L. B. (6)**; *H. †serra* figd. from Pliocene Orissa, **Sarma**; teeth figd. Neogene France, **Leriche**.

Hypogaleus subgen. nov. of *Galeorhinus* q.v.

Mustelus laevis effects of histamine and antihistamine, **Jullien & others**; *M. manazo* abnormal brain structure, **Wang & Li**.

Notogaleus Whitley a synonym of *Galeorhinus* Blainville, **Smith, J. L. B. (7)**.

Prionace glauca distribution, **Strasburg (1)**; distribution, food, reproduction, **Strasburg (2)**; breeding, **Tucker (2)**; breeding in British waters, **Tucker & Newnham**.

Prionodon jegertoni teeth figd. Neogene France, **Leriche**.

Pterolamiops longimanus distribution, food, **Strasburg (2)**; *P. magnipinnis* sp. nov. Algoa Bay, **Smith, J. L. B. (17)** p. 16 figd.

Sphyrna lewini, *S. zygaena* distribution, food, **Strasburg (2)**; *S. †prisca* teeth figd. Neogene France, **Leriche**; *S. tiburo* number and size of young, **Hoese & Moore**; *S. tudes*, **Cadenat (5)**.

†CORONODONTIDAE

Tiarodontus Whitley 1953 redundant, **Trewavas (1)**.

†HYBODONTIDAE

Polyacrodus minimus teeth figd. Rhaetic France, **Guérin**.

SQUALIDAE

Centrophorus nilsoni new Australian record, **Cowper**; *C. scalpratus* new Tasmanian record, **Cowper**.

Centroscymnus waitei recorded from Australia, **Olsen**.

Etmopterus lucifer gestation period and yolk absorption in embryo, **Iwai (1)**.

Scymnodon plunketi recorded from Australia, **Olsen**.

Squalus acanthias bionomics, **Stanescu**; food, **Ionescu & Serpoianu**; movements of a tagged specimen, **Templeman (3)**.

SQUATINIDAE

Scaldiraja nom. nov. for *Scaldia* Le Hon 1871 and *Thaumas* Münster 1842 pre-occ., **Whitley (1)** p. 44.

HYPOTREMATA

Food of Senegalese species, **Cadenat (2)**.

TORPEDINIDAE

Diplobatis guamachensis sp. nov. Venezuela, **Martin S. F. (2)** p. 2 figd.

Narcine brasiliensis morphology of electric organs, **Mathewson & others**.

Narke capensis Gmelin's type re-described, **Wheeler (1)**.

Torpedo marmorata effects of histamine & antihistamine, **Jullien & others**; *T. nobiliana* teratological examples, **Palmer & Wheeler**; *T. ocellata* development of eye muscles, **Wedin**.

RHINOBATIDAE

Rhina ancylostoma from Kochi Prefecture Japan, **Kamohara (1)**.

Rhinobatus halavi development of hyoid arch, **Hamdy (3)**; development of extravisceral cartilages, **Hamdy (2)**; spiracular cartilage, **Hamdy (1)**.

PRISTIDAE

Pristis review of species, **Tortonese (7)**; from Sierra Leone, **Watts (2)**; from Lake Sentani, New Guinea, **Brongersma**.

RAJIDAE

Comparative anatomy, zoogeography and taxonomy of Japanese forms, with keys to genera and species, **Ishiyama (2)**; egg capsules of Japanese species, with key to identification, **Ishiyama (1)**.

Arctoraja subgen. nov. of *Breviraja* q.v.

Bathyraja subgen. nov. of *Breviraja* q.v.

Breviraja (*Arctoraja*) subgen. nov. type *Raja smirnovi* Soldatov & Pavlenko, **Ishiyama (2)** p. 337; *B. (Arctoraja) smirnovi ankasube* subsp. nov. Wakasa Bay, Japan, **Ishiyama (2)** p. 342 figd.; *B. (Bathyraja)* subgen. nov. type *Raja isotrachys* Günther, **Ishiyama (2)** p. 325; *B. (Bathyraja) trachouros* sp. nov. Hokkaido, Japan, **Ishiyama (2)** p. 329 figd.; *B. (Notoraja)* subgen. nov. type *Raja tobitukai* Hiyama, **Ishiyama (2)** p. 322.

Cruriraja rugosa sp. nov. Gulf of Mexico, **Bigelow & Schroeder (1)** p. 226 figd.

Notoraja subgen. nov. of *Breviraja* q.v.

Okamejei subgen. nov. of *Raja* q.v.

Psammobatus spinosissimus, location of type, **Mead (3)**;

Raja (*Okamejei*) **subgen. nov.** type *Raja fusca* Garman, **Ishiyama (2) p. 354**; *R. (Okamejei) acutispina* **sp. nov.** Sea of Japan, **Ishiyama (2) p. 358** figd.; *R. (Okamejei) macrophthalma* **sp. nov.** Aichi Pref., Japan, **Ishiyama (2) p. 363** figd.; *R. (Okamejei) schmidtii* **sp. nov.** Bungo Strait, Japan, **Ishiyama (2) p. 374** figd.; *R. binoculata* ontogeny of hemoglobin, **Sterne**; *R. oregoni* **p. 201** figd.; *R. garrickii* **p. 213** figd.; *R. clarkii* **p. 221** figd. **spp. nov.** Gulf of Mexico, **Bigelow & Schroeder (1)**; *R. (Tengujei)* **subgen. nov.** type *Raja tengu* Jordan & Fowler, **Ishiyama (2) p. 377**; *R. (Tengujei) gigas* **sp. nov.** Aichi Pref., Japan, **Ishiyama (2) p. 386** figd.

Rhinoraja odai **sp. nov.** Izu Peninsula, Japan, **Ishiyama (2) p. 347** figd.

Tengujei **subgen. nov.** of *Raja* q.v.

ARHYNCHOBATIDAE

Arhynchobatis asperimus affinities, **Garrick**.

DASYATIDAE

Key to Tasmanian species, **Scott, E. O. G.**

Dasyatis brevicaudatus redescribed, **Scott, E. O. G.**; *D. pacificus* location of type, **Mead (3)**.

†*Rhombodus blinkhorsti* figd. from Brazil, **Rebouças & Santos**.

Taeniura melanospila description of Indian example, **Kewalramani & Chhappagar**.

Urolophus cardiovascular effects of venom, **Russell & others (1)**; *U. halleri*, properties of venom, **Russell, F. E. & others (3)**.

†PTYCHODONTIDAE

Alloptychodus Whitley 1953 redundant, **Trewavas (1)**.

Ptychodus polygyrus figd. from Switzerland, **Hantke**.

MYLIOBATIDAE

Aetobatis tarcuatus teeth figd. Neogene France, **Leriche**.

Myliobatis californicus properties of venom, **Russell, F. E. & others (3)**; *M. †meridionalis* teeth figd. Neogene France, **Leriche**; *M. †moralensis* rec. **Rusconi** Pliocene Argentine (omitted as **sp. nov.**

vol. 87 no. 846).; *M. cf. tenuicaudatus* figd. Pliocene Japan, **Ozaki**.

MOBULIDAE

Key to species, **Cadenat (6)**.

Mobula diabolus from Kochi Prefecture, Japan, **Kamohara (1)**; *M. lucasana*, location of type, **Mead (3)**; from Senegal coast, **Cadenat (3)**; new Peruvian record, **Morrow (1)**; *M. mobular* description of embryo, **Tortonese (4)**.

†BRADYODONTI

Petalodus figd. from Permian Kansas and Oklahoma, **Miller & Mann**.

HOLOCEPHALI

Distribution in relation to annual isotherms, **Misra**.

CHIMAERIDAE

Chimaera monstrosa occurrence in Eastern Murman, **Mironova**.

Hydrolagus colliei a spawning concentration at Cape Arago, Oregon, **Jopson**.

OSTEICHTHYES

General work on anatomy and systematics, **Grassé & others**.

†INCERTAE SEDIS

Ot. (inc. sedis) †*platessaeformis* **sp. nov.** p. 178 pl. xxviii fig. 2; Ot. (i.c.) †*latus* †*rostratus*, †*tarchanicus* figd. Miocene Azerbaijan, **Pobedina** and others.

Ot. (inc. sed.) *sagittiformis* **sp. nov.** Miocene Lower Rhine, **Weiler (1) p. 351** pl. iii fig. 20.

Ot. (inc. sed.) *triangulus* p. 33 pl. iv figs. 2, 3 *tarchanicus* p. 33 pl. iv fig. 4; *rostratus* p. 34 pl. iv fig. 5; *latus* p. 35 pl. v fig. 1; *modicus* p. 35 pl. v fig. 2; *sarmaticus* p. 35 pl. v fig. 3; *minimus* p. 35 pl. v fig. 4 **spp. nov.** otoliths Miocene Azerbaijan, **Pobedina**.

PALAEOPTERYGII

†ARCHISTIA

PALAEONISCIDAE

Aeduellia blainvillei figd. Permian Saarre, **Theobald**.

Aetheretmon lopatini **sp. nov.** Lower Carboniferous U.S.S.R., **Berg (1) p. 148**.

Birgeria acuminatus & *Gyrolepis quenstedti* figd. Rhaetic France, **Guérin**.

Brownieichthys ornatus a coccolepid, **Griffith**.

Cycloptychius bidens sp. nov. L. Carboniferous U.S.S.R., Matveeva, A. A. p. 159 pl. vi figs. 1-3.

Elonichthys and *Drydenius* scales figd., Vangerow.

Ganolepis gracilis descr. & figd., Berg (1); *G. longicauda* sp. nov. L. Carboniferous U.S.S.R. p. 159 text fig. 1 pl. iii; *G. gracilis* figd., Matveeva, A. A.

Gyrolepidotus microlepis sp. nov. L. Carboniferous U.S.S.R. p. 146 text fig. 1; *G. schmidtii* figd., Berg (1); *G. schmidtii* descr. & figd., Matveeva, A. A.

Oxyteriscus gen. nov. type *O. minimus* sp. nov. L. Carboniferous U.S.S.R., Matveeva, A. A. p. 160 pl. vi figs. 4-5.

Palaeobergia gen. nov. type *Gyrolepidotus microlepis* Berg Matveeva, A. A. p. 159 text fig. 3 pl. v.

Steriolepidella Whitley 1954 antedated by *Osorioichthys* Casier, Trewavas (1).

PHOLIDOPLEURIDAE

Neavichthys Whitley 1951 redundant, Trewavas (1).

PERLEIDIDAE

Perleides cf. *woodwardi* figd. Shensi, China, Chou & Liu.

CLADISTIA

POLYPTERIDAE

Polypterus, specimens in Prague museum, methods of measurement, Oliva & Opatrný; ontogeny of dermal skull and sensory line system, Pehrson; jaw musculature, Stix; *P. senegalensis* subcommissural organ, Olsson (2); larval anatomy, Abdel-Aziz.

CHONDROSTEI

ACIPENSERIDAE

Biological races, *Gerbilskii* (1); raciation in Caspian forms, Pickford.

Acipenser guldenstädti larval development, Dragomirov; Semenov; link between hyoid and mandibular arches during ontogeny, Strelkovsky; *A. guldenstädti* and *A. stellatus* role of calcium ions during fertilization, Detlaiff; *A. ruthenus* receptor neurons of digestive tract, Milochin (1); *A. stellatus* histophysiology of alimentary system, Krainshkina; *A. transmontanus* recorded from Montana, Brunson & Block.

Pseudoscaphirhynchus kaufmanni re-described, Oliva (2).

†BELONORHYNCHII

SAURICHTHYIDAE

Saurichthys, variability of parietal complex, Beltan (1); *S. huanshanensis* sp. nov. Trias China, Chou & Liu p. 303 pl. i fig. 1.

†SUBHOLOSTEI

CATOPTERIDAE

Sinkiangichthys gen. nov. type *S. longiptectoralis* sp. nov. Triassic China, Liu p. 149 pl. i.

NEOPTERYGII

PROTOSPONDYLI

†SEMIONOTIDAE

Lei Whitley 1955 redundant, Trewavas (1).

Lepidotes, neurocranium Bathonian Morocco, Beltan (2).

Panteleon Whitley 1951 redundant, Trewavas (1).

Semionotus unicristatus rec. Rusconi M. Trias Mendoza Argentine (omitted as sp. nov. vol. 89 no. 873).

†MACROSEMIIDAE

Propterus vidalis figd., Bataller.

AMIIDAE

Amia jaw musculature, Stix.

†*Vidalia catalunica* figd., Bataller.

GINGLYMODI

LEPISOSTEIDAE

Lepisosteus osseus origin of extrinsic ocular muscles, Bodemer (1); *L. platyrhincus* an orange coloured specimen, Phillips. C.

ISOSPONDYLI

Distribution in Chinese waters, Tchang.

†LEPTOLEPIDAE

Aethalion vidali figd., Bataller.

Eurystichthys nom. nov. for *Eurystethus* Sauvage 1877 pre-occ., Whitley (1) p. 44.

Thrissops formosus, supposed viviparity, Nybelin (2).

ELOPIDAE

Elopid fish from Cretaceous Colorado figd., Miller, H. W. (2); cranial muscles, Thomas.

†*Apsopelix* Cope 1871 incl. *Syllaemus* Cope 1875 and *Leptichthys* Stewart 1899, Dunkle.

Elops saurus, bucco-hypophysial canal, Olsson (3); sensory canals of snout, Nybelin (1).

†*Helmintholepis vermiculatus* scale figd. incl. *Palaeoclupea dakotaensis* and *Pelycorapis berycinus*, Dunkle.

Megalops atlanticus tagging experiments, Randall & Moffett; morphometry and ecology of young, Harrington (2); *M. flissa* sp. nov. otolith Oligocene-Miocene Victoria, Stinton p. 81 pl. xiii figs. 8 23.

Pachyrhizodus sp. U. Cret. Kansas with intestinal casts, Miller, H. W. (1).

ALBULIDAE

Albula vulpes metamorphosis, Rasquin (1); *A. vulpes neoguinaica* new record from Darwin, N. T., Whitley (2).

Dixonina pacifica, location of type, Mead (3).

Pterothrissus †*pervetustus* sp. nov. Oligocene Victoria, Stinton p. 82 pl. xiii fig. 21.

ALEPOCEPHALIDAE

Alepocephalus productus reported from Gulf of Mexico, Grey (2).

Anomalopterus megalops, location of type, Mead (3).

Bathytroctes drakei, location of type, Mead (3).

Conocara murrayi new Western Atlantic record, Grey (2).

Dolichopteryx binocularis, location of type, Mead (3).

Grimatroctes bullisi sp. nov. Gulf of Mexico, Grey (2).

Macromastax gymnos, location of type, Mead (3).

Narceles stomias recorded from Western Atlantic, Grey (2).

Photostylus pycnopterus compared with type, Grey (1); location of type, Mead (3).

SEARSIDAE

Searsia schnakenbecki structure of luminescent gland, Nicol.

CHIROCENTRIDAE

Chirocentrus dorab structure of alimentary Canal, Srivastava (2).

CLUPEIDAE

Keys to genera and species of Taiwan, Chu & Tsai; use of intestine as diagnostic character, Harder; cranial muscles, Thomas.

Alosa validity of species, Furnestini & Vincent; *A. alosa* reproduction, Hoestlandt; *A. †crassa* figd., Jonet; *A. nordmanni* population study, Zalevsky; *A. sapidissima* migrations, Talbot & Sykes; number of eggs produced, Davis; relative abundance, Walburg.

Anchoa exigua new Peruvian record, Morrow (1).

Anchoviella longipinna, location of type, Mead (3).

Brevoortia tyrannus meristic variation, June.

Cetengraulis mysticetus biometric study, Berdegue (2); alimentary tract as a morphometric character, Harder; growth, sexual maturity and spawning, Howard & Landa.

Clupea harengus functional anatomy of suspensorium and associated structures, Kirchhoff; distribution of larvae in Bay of Fundy and Gulf of Maine, Tibbo & others; races, Bückmann & others; Barents and White Seas races, Tambovtzev; evaluation of the characters used to distinguish races, Wielinga; population study, Hourston; Fuglsetfjord population, Rasmussen; migrations in Passamaquoddy region, McKenzie & Skud; movements in relation to tidal currents, Jones, F. R. H.; nature of spawning area, Bolster & Bridger; spring spawners in Pomerania Bay, Fesolowicz; age-size composition of Manx samples, Bowers; food of young in Caspian Sea, Matveeva; feeding on *Calanus*, Gerasimov; factors affecting feeding behaviour, Blaxter & Holliday (2); feeding behaviour in aquaria, Blaxter & Holliday (1); recapture of tagged specimens, Fridriksson; list of parasites, Dollfus (2); establishment in aquaria, Parrish & others; *C. †longimana*, *C. †sardinites* figd., Jonet; *C. pallasi* fecundity, Nagasaki; role of calcium ions in fertilization, Yanagimachi (2); *C. †suzini* p. 33 pl. iii fig. 5; *C. †tarchanicus* p. 33 pl. iv fig. 1; spp. nov. otoliths Miocene Azerbaijan, Pobedina.

Clupeonella delicatula delicatula bio-nomics, Leonte & Munteanu.

Dorosoma cepedianum fluctuations in stock from the Great Lakes, **Vladykov & Beaulieu**; *D. lacepedi* age and growth, **Berry** (4).

Engraulis encrasicolus spawning season and duration of embryonic development, **Vučetic**; mortality in Azov Sea, **Salnikov**; parasites, **Reichenbach-Klinke** (2); *E. japonicus* distribution in Pacific, **Birman**; vertical movements, **Inoue & Ogura** (1); scale characters, **Kondo**; age determination from scales, **Hayashi & Kondo**; population study, **Kubo, I. & others**; jumping behaviour of shoals, **Inoue & Ogura** (2).

Ethmalosa dorsalis food, **Bainbridge, V.**

Gadusia chapra structure of tongue, **Kapoor** (2); structure of alimentary tract, **Kapoor** (3); alimentary canal, **Srivastava** (3).

Harengula hualiensis sp. nov. Taiwan, **Chu & Tsai** p. 116 figd.

Hilsa symposium on fishery of, **Hora** (1); *H. ilisha* biology and fisheries, **Pillay** (2); from west coast of India, **Kulkarni**; of Chilka Lake, **Mitra**; breeding in Ganges, **Motwani & others**; physiology and morphology of blood, **Pillay** (3).

Pomolobus pseudoharengus growth study, **Graham, J. J.**; schooling behaviour, **Graham, J. F. G.**

Sardina pilchardus bionomics, **Heldt** (1); biometric study, **Matta** (3); population study, **Muzinic** (2); population study in Adriatic, **Karlovac**; Tyrrhenian Sea population study, **Matta** (2); growth study, **Larrañeta & López**; average weight of Portuguese population, **Oliveira & Pinto**; scale for studying sexual maturation, **Pinto J. de S. & Andreu**; spawning season and early development, **Oliver**; distribution of eggs in Adriatic, **Gamulin & Karlovac**; parasites, **Reichenbach-Klinke** (2); parasitising by *Peroderma*, **Larrañeta** (1).

Sardinella gibbosa bionomics, **Ganapathi & Rao**.

Sardinops caerulea age determination from otoliths, **Mosher**; fecundity, **Mac Gregor**; *S. ocellata* age composition of catches, **Davies** (2); predation by seabirds, **Davies** (1).

Sprattus sprattus phalericus bionomics in Rumanian waters, **Cantes**.

Stolothrissa tanganyicae bionomics, **Marlier** (2).

Ot. (*Clupea*) †*gidjakensis* sp. nov. Miocene Azerbaijan p. 177 pl. xxvii fig. 4; Ot. (*C.*) †*tarchanicus*, Ot. (*C.*) †*suzini* figd., **Pobedina et al.**

Ot. (*Clupeidarum*) †*gratus* sp. nov. Miocene Azerbaijan **Pobedina et al.** p. 177 pl. xxvii fig. 3.

CHANIDAE

Chanos chanos reproduction, **Tampi**; oxygen consumption, **Job** (2).

CROMERIIDAE

Cromeria nilotica distribution and bionomics, **Aubenton**; *C. nilotica occidentalis*, **R. Volta, Daget** (6).

SALMONIDAE

Degree of anadromy of N. American genera, **Rounsefell** (3); fecundity of North American forms, **Rounsefell** (1); of Macedonian river systems, **Karaman**; age at sexual maturity of Yugoslav examples, **Branko**; physiology and genetics of embryonic development, **Spaas & Heuts**; method for determination of oxygen consumption in ova, alevins and fishes of different sizes, **Spaas**.

Coregonus the species problem, **Brooks**; population study, **Svärdson** (2); *C. albula* age and growth in Arendsee, **Bauch** (1); culture of, **Bauch** (2); gill blight in an experimental fish-pond, **Poland, Huculak**; *C. clupeoides* bionomics, **Slack & others**; *C. clupeoides stigmaticus* occurrence in Lake District, **Frost & Le Cren**; *C. dispersus* notes on two examples from Lake Léman, **Spillmann**; *C. fera*, *C. macrophthalmus* comparison of chromosome count and DNA content of nuclei, **Bargetsi**; *C. lavaretus* population study, **Maniakas**; *C. lavaretus maraenoides* a biologically homogeneous group, **Shirkova**; *C. lavaretus maraenoides* × *C. albula* morphology of hybrids, **Gasowska**; *C. lavaretus nelinuschi* a developmental stages, **Smolyanov**; *C. peled* presence in Dnieper river, **Nosal**; *C. pidschian*, *C. peled* food competition in Lake Vojmsjön, **Nilsson**.

Hucho hucho early development, **Balon** (2); in Roumanian waters, **Homei**.

Leucichthys feeding habits, **Bersamin**.

Oncorhynchus evolution of migratory behaviour in young, **Hoar** (3); hermaphrodite gonads, **Hikita** (3); reaction of juveniles to light, **Hoar & others**; results of tagging experiments, **Milne**; structure and response of retina, **Brett & Ali**; *O. gorbuscha* size at maturity and at spawning migration, **Skud**; development of pronephros, **Ford & Newstead**; *O. keta*, embryo, **Nishida** (1 & 2); behaviour of young, **Kobayashi**, **T.**; spawning behaviour, photos, **Sano, S. & Nagasawa**; colour-varieties, **Hikita** (2); tagging experiments, **Nishino**; marking experiments, **Sakano & Miura**; *O. kisutch* bionomics, **Shapovalov & Taft**; movements, **Donaldson & Allen**; *O. masou* a land locked form, **Nakamura, M. & Kawai** (2); *O. nerka* population study, **Kubo, T.**; age composition and sex ratio, **Foskett & Jenkinson**; age and size at sexual maturity, **Godfrey** (2); cyclic fluctuations in Karluk river, Alaska, **Rounsefell** (2); relation between photosynthesis rate of phytoplankton and growth of salmon, **Nelson**; *O. nerka*, *O. gorbuscha* resistance of young to low temperatures, **Brett & Alderdice** (2); *O. nerka*, *O. kisutch* effect of temperature on swimming speed of young, **Brett & others**; *O. tshawytscha* effect of light on early growth, **Eisler** (1).

Salmo clarki annotated bibliography, **Cope**; *S. clarki lewisi* a case of hermaphroditism, **Benson**; *S. gairdneri* colour photos of leaping fish, **Davidson**; fixation of radioactive phosphorus in the brain & other tissues, **Palayer**; *S. gairdneri gairdneri* bionomics, **Shapovalov & Taft**; with three pelvic fins, **Maxfield**; *S. gairdneri irideus* embryonal development, **Pleva**; hematology, **Weinreb**; action of potassium, magnesium & calcium ions on thyroid function, **Etienne**; *S. irideus* vascular system in pseudobranch, **Solewski** (1); *S. lacustris* growth study, **Merlo** (1); *S. salar* recent investigations in U.S.S.R., **Nikolsky** (2); factors affecting parr to smolt metamorphosis, **Elson** (1); transition from parr to smolt, **Evropeitzeva**; long distance migration, **Menzies & Shearer**; Shubenacadie river population, **Huntsman**; bionomics in Ireland, **Went** (1); of river Shannon, **Twomey**; movements in river Erne, **Jackson, P. A.**; movements of tagged specimens, **Pyefinch & Shearer**; **Shearer**; weight of large Icelandic examples, **Gudjonsson**; feed-

ing on *Belone belone*, **Eaton**; *S. salar*, *S. trutta* competition between young, **Kalleberg**; *S. salar*, *S. trutta*, *S. gairdneri* size of fish in relation to osmoregulation, **Parry**; *S. trutta* age and growth of Vistula river spawners, **Zarnecki** (3); food and growth, **Stinson**; seasonal variation in growth rate, **Swift**; growth in Lough Glore, Ireland, **Healy & Kennedy**; increased growth in Loch Tummel after flooding, **Campbell**; amount of eggs from winter forms of different size, **Zarnecki** (2); homing behaviour, **Stuart** (1); from western Mediterranean, **Andouin & Maurin**; respiratory rate of heart during development, **Grodzinski & Pigoñ**; development of eye, **Nüesch**; air bubble disease, its cause and cure, **Rukavina & Varenika** colour variation, **Dyk** (2); *S. trutta*, *S. gairdneri* fecundity, **Nicholls** (4); *S. trutta m. fario*, *S. gairdneri irideus* number and size of eggs, **Pekarkova**.

Salvelinus, Pleistocene, **Brunner**; age and growth study, **Cable**; *S. alpinus* ecological investigations in running waters, **Curry-Lindahl**; *S. fontinalis* living conditions in a high altitude lake, **Reimers** (2); occurrence in Lake District, **Frost & Le Cren**; food and growth, **Desmarais**; movements in fresh and salt water, **Smith, M. W. & Saunders**; oxygen consumption, **Job** (1); colour photos of embryos, **Davidson**; *S. fontinalis*, *S. alpinus* thermal relations of geographic races, **McCauley**; *S. namaycush* bionomics, **Van Oosten & Eschmeyer**.

Stenodus leucichthys, *S. l. nelme* developmental stages, **Smolyanov**.

Thymallus bionomics of in Murmansk area, **Vladimirskaya**; *T. thymallus* distribution in U.S.S.R. waters, **Dyk** (1); occurrence in Carpathian rivers, **Dik**; artificial spawning, **Svetina**.

OPISTHOPTERIDAE

Macropinna microstoma new Californian record, **Bradbury & Cohen**.

Opisthoproctus description of new type of light organ, **Bertelsen** (1).

ARGENTININAE

Argentininae keys to genera and species, **Cohen, D. M.** (2).

Argentina elongata australiae subsp. nov. New South Wales, **Cohen, D. M.** (2) p. 138; *A. silus* structure and function of swimbladder, **Fänge**.

Bathylchnops gen. nov. p. 48 type *B. exilis* sp. nov. p. 50 figd., North Pacific (39° 08' N., 164° 51' W.), Cohen, D. M. (4).

Glossanodon (*Glossanodon*) *polli* sp. nov. off W. African coast, Cohen, D. M. (2) p. 151 figd.; *G.* (*Prosoarchus*) subgen. nov. p. 155 type *Glossanodon* (*Prosoarchus*) *pygmaeus* sp. nov. Gulf of Mexico p. 156 figd., Cohen, D. M. (2).

Nansenia candida sp. nov. North Pacific (41° 39' N., 139° 02' W.), Cohen, D. M. (5) p. 53 figd.

Prosoarchus subgen. nov. of *Glossanodon* q. v.

MICROSTOMIDAE

Bathylagus comps Western North Atlantic p. 1 figd., *B. greyae* Bermuda p. 5 figd. spp. nov., Cohen, D. M. (1); *B. longirostris* recorded from Gulf of Mexico, Cohen, D. M. (1).

Halaphya possible affinities, Cohen, D. M. (3).

Microstoma microstoma nomenclature, Cohen, D. M. (3).

Xenophthalmichthys danae redescribed from additional material, type figd., relationships, Bertelsen (2).

OSMERIDAE

Hypomesus japonicus number of eggs produced, Ito, K.; *H. olidus* factors influencing spawning, Shiraishi & Tokunaga; age when ascending river, Hamada (1); age and growth, Hamada (2).

Mallotus villosus spawning season and meristic study, Pitt (1); age and growth, Pitt (2).

Osmerus mordax age and growth, McKenzie.

Plecoglossus altivelis reproduction in a land-locked population, Fujimoto; varying population densities, Kawanabe & others (1).

GONOSTOMATIDAE

Cyclothone microdon, reduction of gills, Iwai (3).

Gonostoma, species with and without swimbladder, Denton & Marshall; *G. elongatum* (in error *elongata*) description of specimen taken off Ceylon, Silva (2).

Ichthyococcus irregularis sp. nov. Eastern Pacific, Rechnitzer & Böhlke p. 11 figd.

Manducus argenteolus new Peruvian record, Morrow (2).

Maurolicus muelleri from Ligurian Sea, Torchio (1); *M. pennanti* histochemistry of luminous organ, Bassot.

Photichthys nonsuchae, location of type, Mead (3).

Vinciguerria lucetia development and distribution, Ahlstrom & Counts; *V. lucetia* compared with *V. pacifici*, Morrow (2); *V. lucetia*, *V. nimbaria*, *V. poweriae* distinguishing characters during development, Ahlstrom & Counts.

Yarella corythaeola new Moroccan record, Furnestin & others.

STERNOPTYCHIDAE

Argyropelecus colour photos, Zahl; *A. olfersii* new Peruvian record, Morrow (2).

ASTRONESTHIDAE

Neonesthes gnathoprora, *N. nicholsi*, location of types, Mead (3).

STOMIATIDAE

Bathophilus altipinnis, location of type, Mead (3); *B. filifer* new Peruvian record, Morrow (2); *B. flemingi* sp. nov. North Pacific, Aron & McCrery (1) p. 181 figd.; Aron & McCrery (2) p. 56 figd.

Chirostomias lucidimanus, location of type, Mead (3).

†*Enchodus libycus*, *E. oliveirai*, *E. elegans* teeth figd. from Brazil, Reboucas & Santos.

Eustomias gatterleei, *E. schiffi*, location of types, Mead (3).

Idiacanthus panamensis new Peruvian record, Morrow (2).

Lamprotoxus angulifer, location of type, Mead (3).

Leptostomias bermudensis, location of type, Mead (3).

Macrostomias calosoma, location of type, Mead (3).

Melanostomias bulbosus, location of type, Mead (3).

Photoneustes bifilifer, *P. cornutus*, location of types, Mead (3).

Stomias colubrinus new Peruvian record, Morrow (2); *S. fusus*, location of type, Mead (3).

MALACOSTEIDAE

Aristostomias photodactylus, location of type, **Mead (3)**.

Ultimostomias mirabilis, location of type, **Mead (3)**.

OSTEOGLOSSIDAE

Heterotis niloticus development and structure of skull, **Daget & Aubenton**; reproduction, development and growth, **Daget (1)**.

NOTOPTERIDAE

Notopterus chitala swimbladder, **Dehadrαι**.

MORMYRIDAE

Function and evolution of electric organs, **Lissmann (1)**.

Gnathonemus longibarbis, food and adaptability, **Corbet (1)**; *G. niger, pictus, senegalensis*, Volta specimens described, **Daget (6)**; *G. senegalensis elongatus*, controlling mechanism of electric discharge, **Szabo, T.**.

Marcusenius isidori, lhuysi, in R. Volta, **Daget (6)**.

Mormyrus hasselquisti in R. Volta, **Daget (6)**; *M. kannume* description of electrical receptor, **Wright**; feeding habits, **Macdonald**; food and adaptability, **Corbet (1)**; *M. rume* postlarvae, **Daget (5)**.

Petrocephalus, species of R. Volta, **Daget (6)**.

GYMNARCHIDAE

Gymnarchus sensory perception of electric discharge, **Lissmann & Machin**; *G. niloticus*, Volta system, **Daget (6)**; controlling mechanism of electric discharge, **Szabo, T.**

GONORHYNCHIDAE

Gonorynchus gonorhynchus Linnaeus's type redescribed, **Wheeler (1)**.

HAPLOMI

Notes on European forms, **Heuschmann (1)**.

ESOCIDAE

Esox natural hybrids, **Raney (3)**; method of swallowing prey, **Kuzmenko**; *E. lucius*, development, **Forsyth**; **Gühr**; post embryonal development, **Čihař (2)**; influence of environmental medium on development, **Tschörtner**; distribution, skeleton, **Janec-Suslowska**; early sexual differentiation, **Cocco**;

spawning behaviour, **Fabricius & Gustafson**; Vistula spawning investigations, **Strzyzewska**; bionomics, **Munro, W. R.**; bionomics of Baltic specimens, **Hegemann**; bionomics of in Russian lakes, **Shilenkova**; population study, **Ridenhour**; growth and size at maturity, **Schultz, F. H.**; food and growth; *E. lucius* compared with *E. masquinongy*, **Čihař (1)**; development of eye, **Nüesch**; vascularization of pineal body, **Towarnicki**.

UMBRIDAE

Umbra limi bionomics, **Peckham & Dineen**; *U. krameri* not in Neusiedlersee, **Bauer, K.**; *U. krameri krameri* bionomics, **Libosvsky & Kux**; *U. krameri pavlovi* subsp. nov. Black Sea, **Kux & Libosvsky**.

DALLIIDAE

Dallia pectoralis feeding habits; tissue chemistry, **Nardone**.

INIOMI

AULOPIDAE

Aulopus filamentosus nomenclatorial note, **Mead (1)**; *A. nanas* sp. nov. Gulf of Mexico, **Mead (1)** p. 188 figd.

SYNODONTIDAE

Cranial muscles, **Thomas, A. E.**
Synodus saurus new Moroccan record, **Furnestin & others**.

SUDIDAE

Bathypterois key to North Atlantic species, **Mead (2)**; *B. (Bathypterois) bigelowi* sp. nov. Caribbean Sea, **Mead (2)** p. 366 figd.; *B. dubius* morphology of thyroid, **Bongis & Ruivo**.

Bathytyphlops marionae sp. nov. Caribbean Sea, **Mead (2)** p. 370 figd.

Benthosaurus underwater photo, **Hout**.

Chlorophthalmus agassizi new Moroccan record, **Furnestin & others**; *C. brasiliensis* sp. nov. off Northern Brazil, **Mead (2)** p. 362 figd.

Lestidium nudum possible luminous organ, **Haneda**.

NOTOSUDIDAE

Notosudis argenteus Maul a synonym of *N. hamiltoni* Waite, **Morrow (2)**; *N. hamiltoni* redescribed, **Morrow (2)**.

MYCTOPHIDAE

Present in Ligurian Sea, **Torchio** (2).

Diaphus metoplocampus from Ligurian Sea, **Tortonese** (10); *D. sagamiensis* further specimen from Japan, **Okada & Mori** (2).

Lampanyctus mexicanus new Peruvian record, **Morrow** (2); *L. polyphotis*; *L. septilucis*, location of types, **Mead** (3).

Leuciscus polysarcus = ? *Diaphus*, **Jermanska** (2).

Myctophum affine new Peruvian record, **Morrow** (2); *M. punctatum* structure of photophore and light intensity, **Nicol**.

Neoscopelus microchir new Moroccan record, **Furnestin & others**.

PARALEPIDIDAE

Paralepis underwater photo, **Houot**.

OMOSUDIDAE

Omosudis lowei description of post-larvae; distribution, **Ege**.

CETUNCULI

CETOMIMIDAE

Cetomimus craneae; *C. teevani*, location of types, **Mead** (3).

MIRIPINNATI

MIRAPINNIDAE

Mirapinna esau morphology of "hairs," **Halstead & others**.

EUTAENIOPHORIDAE

Eutaeniophorus nom. nov. for *Taeniophorus* Bertelsen & Marshall, pre-occ., **Bertelsen & Marshall** p. 9; *E. festivus* recorded from eastern Pacific, **Bertelsen & Marshall**.

LYOMERI

SACCOPHARYNGIDAE

Saccopharynx harrisoni, location of type, **Mead** (3).

OSTARIOPHYSI

Anal fin position in Catostomidae and Cyprinidae, **Hubbs, C. L.** (1).

CYPRINOIDEA

CHARACIDAE

Key to the Xenurobryconini, **Böhlke** (2).

Key to Glandulocaudine genera, **Böhlke** (3).

Alestes, species of R. Volta, **Daget** (6); *A. macrolepidotus* maximum weight, **Cozens**.

Anoptichthys jordani morphology of lateral line system, **Grobbe & Hahn**; ocular melanoma, **Stolk** (7).

Apareiodon machrisi sp. nov. Brazil, **Travassos** (3) p. 147 figd.

Astyanax mexicanus light sensitivity of pineal organ, **Grunewald-Lowenstein**; morphology of optic development, **Cahn**; *A. mexicanus* × *Anoptichthys jordani* Mendelian inheritance in hybrids, **Sadoglu**.

Brachyhalcinus nummus sp. nov. Ecuador, **Böhlke** (3) p. 74 figd.

Brycon acutus sp. nov. Ecuador, **Böhlke** (3) p. 67 figd.

Catopryon mento recorded from Venezuela, **Ramirez, E.**

Cyrtocharax squamosus redescribed, **Aramburu**.

Deuterodon review of genus, **Travassos** (1); *D. langei* sp. nov. Brazil, **Travassos** (1) p. 81 figd.

Ephippicharax orbicularis carcinoma of upper lip, **Stolk** (6).

Evermannella borodini sp. nov. for *Odontostomus balbo atlanticus* Borodin, **Whitley** (2).

Exodon paradoxus recorded from Venezuela, **Ramirez, E.**

Hasemanianella hansenii (Fowler) redescribed, **Böhlke** (3).

Hemibrycon orcési sp. nov. Ecuador, **Böhlke** (3) p. 25 figd.

Hemigrammus armstrongi sp. nov. British Guiana, **Schultz & Axelrod** p. 5 figd.; *H. erythrozona*, breeding, **Hillmer**; *H. ocellifer falsus* subsp. nov. Amazon, **Meinken** (3) 230, fig.

Hydrocyon lineatus maximum weight, **Cozens**.

Hypessobrycon tortuguerae sp. nov. Costa Rica, **Böhlke** (4) p. 173 figd.

Hysteronotus hesperus sp. nov. Ecuador, **Böhlke** (3) p. 35 figd.

Micralestes acutidens elongatus subsp. nov., Haute-Volta, p. 126 fig. 11, *M. occidentalis*, **Daget** (6).

Moenkhausia naponis sp. nov. Ecuador, **Böhlke** (3) p. 14 figd.; *M. oligolepis* recorded from Venezuela, **Ramirez, E.**

Phenacogrammus interruptus myxoma of skin, **Stolk** (5).

Pyrrhulina vittata, breeding, **Schapitz** (1).

Rhoadsia eigenmanni compared with *Hyphessobrycon tortuguerae*, **Böhlke** (4).

Roeboides guatemalensis, development and function of paired fins, **Ostermüller** (2).

Tytocharax rhinodus p. 320 figd., *T. atopodus* p. 323 figd. spp. nov. Peru, **Böhlke** (2).

GASTROPELECIDAE

Carnegiella vesca description of flight, **Weitzman** (1). *C. strigata*, *vesca*, *marthae*, *myersi*, photos, **Weitzman** (2).

Gasteropelecus maculatus, *sternicla*, photos, **Weitzman** (2); *G. sternicla* Linnaeus's type redescribed, **Wheeler** (1).

Thoracocharax securis, *stellatus*, photos, **Weitzman** (2).

ANOSTOMIDAE

Anostomus trimaculatus recorded from Venezuela, **Ramirez**, E.

Chilodus punctatus opercular tumour, **Stolk** (5).

HEMIODONTIDAE

Characidium rex sp. nov. Ecuador, **Böhlke** (3) p. 92 figd.

Hemiodus semitaeniatus recorded from Venezuela, **Ramirez**, E.

Nannostomus beckfordi aripiragensis behaviour; swimbladder function, **Wickler** (1).

Poecilobrycon trifasciatus, *P. ocellatus* recorded from Venezuela, **Ramirez**, E.

CITHARINIDAE

Species of Haute-Volta, **Daget** (6).

Neolebias ansorgei, *landgrafi*, distinguishing colours, *N. ansorgei*, behaviour in aquarium, adhesive apparatus of larva, **Schapitz** (3).

Paradistichodus, taxonomy, structure, food, **Daget** (3).

GYMNOTIDAE

Function and evolution of electric organs, **Lissman** (1).

ELECTROPHORIDAE

Electrophorus electricus structure of electric organ, **Luft**; effect of potassium on electroplax, **Altamirano & Coates**.

CATOSTOMIDAE

Skull and Weberian ossicles, **Ramawami**.

CYPRINIDAE

Identification using form and number of pharyngeal teeth, **Vásárhelyi**; intestinal differences as a specific character, **Kafuku**; structure and taxonomy of European forms, **Heuschmann** (2); variability of fin ray numbers, **Miaskowski**; structure of pharyngeal teeth, **Cheprakova**; nomenclature of varieties, **Torbett**; antigens common to some species, **Bocchi & Mainardi**.

Abramis brama embryonic development, **Dziekonska**; bionomics, **Popescu**, L. (2); pharyngeal teeth, **Tolg**; *A. brama darmbii* × *Rutilus rutilus* hybrid, **Pavlov**; *A. sapa* growth and food, **Popescu**, L. (1).

Allochela subgen. nov. of *Chela* q.v.

Aristichthys nobilis food habits, **Nie & Chiang**.

Barbus, see also *Puntius*.

Barbus, evaluation of specific characters, probable synonyms among African species, *B. nigeriensis* polymorphic, *B. deserti* synonyms and description, *B. ablabes spurrelli*, *B. nigeriensis boboi*, *B. trispilus*, *B. eburneensis*, *B. svensoni*, *B. macinensis*, *B. stigmatopygus*, *B. leonensis*, *B. pobeguini*, *B. apogonostomatus*, specimens from French Guinea descr. and figd., **Géry**; species of Volta system, West Africa, *B. parablades* p. 134 fig. 13, *B. atakorensis* p. 140 fig. 17 spp. nov., **R. Pendjari**, **Daget** (6); key to Transvaal species, **Groenewald**; morphology of Transcarpathian species, **Dovgan**; *B. afrovernayi* from Upper Zambezi system, **Jubb** (2) *B. bernardcarpi* sp. nov. Upper Zambezi system, **Jubb** (2) p. 183 figd.; *B. cookei* Gilchrist and Thompson a synonym of *Varicorhinus brucei*, **Groenewald**; *B. (Puntius) curmuca* sexual dimorphism, **Raj**; *B. eutaenia* Boulenger a synonym of *B. kerstenii* Peters, **Groenewald**; *B. hulstaerti*, see *Capoeta*; *B. kahajani* nom. nov. for *B. tetrazona* Bleeker 1857, **Hoedeman** (1) p. 201; *B. mahecola* Val. a synonym of *B. filamentosus* Val.; *B. stigma* Val. 1842 a synonym of

B. sophore Hamilton 1822; *B. stoliczkae* (Day 1869) a synonym of *B. ticto* (Hamilton 1822); *B. sumatranus* (Bleeker 1860) a synonym of *B. tetrazona* (Bleeker 1855), **Hoedeman** (1); *B. mentalis* Gilchrist and Thompson, *B. gilchristi* Boulenger synonyms of *B. holubi* Steindachner, **Groenewald**; *B. meridionalis* from N. E. Slovakia, **Kux & Weisz**; *B. pienaarii* Fitzsimons a synonym of *B. kimberleyensis* Gilchrist and Thompson, **Groenewald**; *B. sabiensis* Gilchrist and Thompson a synonym of *B. brucei* Boulenger, **Groenewald**; *B. stigma* structure of digestive tube, **Kapoor** (1); occurrence of oocyte in testis, **Sathyanesan** (1); *B. stigma*, *Catla catla* structure of tongue, **Kapoor** (2); *B. treurenensis* sp. nov. Transvaal, **Groenewald** p. 323 figd.; *B. umbeluziensis* sp. nov., Transvaal, **Groenewald** p. 315 figd.; *B. zelleri* = *Puntius lateristriga*, q.v.

Barilius senegalensis, Volta system, **Daget** (6).

Blicca bjoerkna in Czechoslovakia, **Opatrný**; spawning and larval development, **Frank** (2).

Brachydanio albolineatus, colour-photo; *B. rerio*, *nigrofasciatus*, photos, **Pinter** (2); *B. rerio* developmental stages, **Hisaoka & Battle**.

Caecobarbus geertsi habitat, **Heuts & Leleup**; phototaxis and thermotaxis, **Thines** (1).

Capoeta hulstaerti, in aquarium, **Meinken** (1).

Capoetobrama kuschakewitschi bionomics, **Maxunov**.

Carassius auratus history of domestication, **Chen**; *C. carassius* growth of body surface and respiratory surface of gills, **Solewski** (4); *C. carassius m. humilis* feeding habits in Central Bohemia, **Čihař** (3).

Catla catla structure of alimentary tract, **Kapoor** (4).

Chalcalburnus chalcoides schischkovi food and growth rate, **Kasumov**.

Chela key to subgenera and species, **Silas** (2); *C. (Allochela)* subgen. nov. p. 64 type *C. (Allochela) fasciata* sp. nov. p. 87 figd. Malabar, **Silas** (2); *C. (Neo-chela)* subgen. nov. p. 64 type *Laubuca dadidurjori* Menon, **Silas** (2) p. 92; *C. cachiis* synonymy and occurrence in W. Pakistan, **Sufi** (2).

Chondrostoma nasus distribution and growth, **Banarescu & others**; growth rhythm, **Stefan, G.**; feeding habits, **Paschalski**; food of forms in Moravice river, Czechoslovakia, **Vejmola**; sexual dimorphism, fecundity, **Szabo, Z.**

Cirrhitina reba changes occurring in pituitary, **Sathyanesan** (2).

Clinostomus elongatus food, growth and sexual dimorphism, **Schwartz & Norvell**.

Ctenopharyngodon idellus spawning behaviour and development, **Inaba & others** (1); digestive system and feeding habits, **Inaba & Nomura**.

Cyclocheilichthys apogon, in calcareous waters of rice-fields, **Johnson**.

Cyprinus carpio, Pleistocene, **Brunner**; abnormalities of vertebral column, **Wunder** (2); skeletal musculature, **Ping & others**; larval development, **Balon** (6); developmental stages, **Balon** (8); growth and development, **Necrasov & others** (3); age and growth, **Schoffman** (1); **Papadopol** (1); growth and development in aquaria and open water, **Necrasov & others** (2); growth of body surface and respiratory surface of gills, **Solewski** (4); respiratory surface of the gills in one and two-year old fish, **Solewski** (7); development and ripening of gonads, **Solewski** (2) & (5); morphology and function of palatal organ, **Jara** (1); distribution of fat in overwintering fish, **Solewski** (6); aerocardiac reflex and escape phenomenon **Serfiat & Raynaud**; recorded from Lake Superior, **Ryder**; biometric study **Mišik** (3); *C. carpio* morpha *hungaricus*, **Balon** (4); development of squamation **Balon** (7).

Esomus spp. habitat, behaviour in aquarium, **Apelt**.

Garra ethelwynnae sp. nov. Eritrea **Menon, A. G. K.** (3) p. 450 figd.; *G. hughi* sp. nov. High Range Travancore **Cochin, Silas** (1) p. 2 figd.

Gila atraria survival rates of normal and abnormal forms, **John**.

Gobio uranoscopus, *G. kessleri* from N.E. Slovakia, **Kux & Weisz**.

Gyrinocheilus aymonieri, respirator mechanism, feeding, **Lüling** (1); in aquarium, **Benl**; photos, **Foersch** i **Benl**.

Hypophthalmichthys molitrix spawning behaviour and development, **Inaba & others** (1); digestive system and feeding habits, **Inaba & Nomura**; food habits, **Nie & Chiang**; suprabranchial organ as a food sifting mechanism, **Zambrihorshch; Verigin**; *H. molitrix*, *Aristichthys nobilis* morphological differences, **Yokote** (1).

Labeo rohita oxygen requirements of fry, **Motwani & Bose**; *L. rohita*, *L. cabasu*, *Cirrhina mrigala* results of cross-fertilization, **Husain**.

Leuciscus borysthenicus new to Roumanian waters, **Banarescu** (2); *L. idus* artificial reproduction and embryonic development, **Popescu, E. & others**; *L. presbyter* Cuvier and Valenciennes 1844, considered a synonym of *Barbus* (*Puntius*) *amphibius* (Cuv. & Valen.) 1842 **Guibé & Spillmann**.

Luxilus roseus Jordan a synonym of *Notropis texanus* (Girard), **Suttkus** (2).

Microbarbus provisional gen. nov. (no type), **Géry** p. 6.

Moniana deliciosa Girard a synonym of *Notropis texanus* (Girard), **Suttkus** (2).

Mylocheilus caurinum × *Ptychocheilus oregonense* osteology of hybrid, **Weisel**.

Neochela subgen. nov. of *Chela* q.v.

Notemigonus crysoleucas scales from Connecticut sediment core, **Lagler & Valleryntine**.

Notropis coccogenis bionomics, **Outten**; *N. illicebrosus*, *N. dorsalis* new Kansas records, **Cross & Minckley**; *N. rubellus* & *Campostoma anomalum pullum* early development, **Reed**; *N. saladonis* sp. nov. Northeastern Mexico, **Hubbs & Hubbs** p. 297 figd.; *N. spilopterus* distribution and variation in the U.S.A., **Gibbs, R. H.** (2); *N. spilopterus hypsismatus* subsp. nov. Wonder Lake, Illinois, **Gibbs, R. H.** (2) p. 195 figd.; *N. stramineus* (Cope) to be used for species previously known as *N. deliciosa* (Girard), **Suttkus** (2).

Osteochilus hasseltii (Cuvier & Valenciennes) considered synonymous with *O. vittatus* (Cuv. & Valen.); *O. vittatus* sensu Bleeker, regarded as a distinct form, **Guibé & Spillmann**.

Oxygaster hypophthalmus, ecological requirements, **Johnson**.

Paralaubuca typus, distribution in Malaya, **Johnson**.

Pelecus cultratus spawning migration, **Kaj** (1).

Phoxinus phoxinus effect of temperature on reproductive cycle, **Ioff**.

Pimephales promelas, *Semotilus atromaculatus*, *Hybopsis* cf. *gracilis* rec. Pleistocene Oklahoma, **Smith, C. L.**

Pseudorasbora parva uchidai subsp. nov. Mie Prefecture, Japan, **Okada & Kubota** (1) p. 99 figd.

Puntius, ecological requirements of Malayan species, **Johnson**; *P. lateristriga*, variation, synonymy, possible subspecies, **Klausewitz** (2); *P. sophore*, *P. sarana* feeding habits, **Moitra** (2); *P. stigma*, *P. ticto*, *P. vittatus* fecundity, **Ibrahim**.

Rasbora, ecological requirements of Malayan species, **Johnson**; key to *pauciperforata* group of species, **Meinken** (5); *R. labuana* sp. nov. off Borneo, **Whitley** (2) p. 28 figd.; *R. somphongsi* sp. nov., R. Menam, **Meinken** (2) 67 fig. (published March 1st.); **Meinken** (5) p. 1 figd. (published October 1st.).

Rhinichthys atratulus obtusus breeding behaviour, **Schwartz**.

Rhodeus amarus occurrence in Lake District, **Frost & Le Cren**; *R. ocellatus* ovarian eggs, **Yokote** (2).

Rutilus rutilus age and growth study, **Balon** (1); feeding habits, **Hruška; Paschalski**; temperature range, **Cocking**.

Sarcocheilichthys variegatus new for Echigo Province, Japan, **Honma** (1); morphometric study of three forms, **Yonezawa**.

Scardinius erythrophthalmus food and growth rate, **Čihař & Frank**; occurrence in Lake District, **Frost & Le Cren**; *S. racovitza* sp. nov., thermal pond, Rumania, **Müller, G. J.**, 165 figs. 1-3.

Tinca tinca condition of the gonads in the annual cycle, **Solewski** (3); influence of fresh and salt water on plasma content, **Cordier, D. & others** (2).

Typhlogarra widdowsoni, brain, sense organs and light sensitivity, **Marshall & Thines**.

Varicorhinus key to Transvaal species, **Groenewald**; *V. (Barbus) nasutus* Gilchrist and Thompson a synonym of *V. brucii*, **Groenewald**.

Vimba vimba carinata food and growth rate, **Kasumov**; feeding habits, **Munteanu**; spawning migrations in Don river, **Zhukovski**.

COBITIDAE

Structure and taxonomy of European forms, **Sterba** (2); intergeneric hybrids, **Kobayashi**, H. (1); physiological isolation through hybrid sterility, **Minamori** (1); sterility and inviability of hybrids, **Minamori** (2).

Barbatula toni oreas development, **Kobayashi** & **Moriyana**.

Botia hymenophysa sound production as a defense weapon, **Klauswitz** (6); *B. striata kolhapurensis* var. nov. Kolhapur District, India, **Kalawar** & **Kelkar** p. 677.

Cobitis aurata balcanica biometric study, **Mišik** (2).

Didymophysa nom. nov. for *Deuterophysa* Rendahl 1933 and *Diplophysa* Kessler 1874 pre-occ., **Whitley** (1) p. 44.

Misgurnus anguillicaudatus colour varieties, **Kobayashi**, H. (2); *M. fossilis* localities in France; note on air-breathing and behaviour, **Arnoult**.

Nemacheilus of Turcomania, **Nikolsky** (1); *N. barbatulus* bionomics, **Libosvarysky**; histogenesis of egg membrane, **Sterba** (3); *N. barbatulus erythrina* golden variety from Czechoslovakia, **Frank** (4); *N. kessleri turcomanus* subsp. nov. Kuskh river, Turcomania, **Nikolsky** (1) p. 32 figd.; *N. kuisperi*, fig. and descr., **Wickler** (5); *N. †musceli* figd., **Jonet**.

SILUROIDEA

Key to indigenous species of Chile, **Buen** (3).

ARIIDAE

Arius development of skull, **Srinivasachar** (3); *A. jella* albino example, **Gupta** & **Bhownick**; *A. manillensis*, *A. thalassinus*, *A. leiotocephalus*, **Tolentino** & **Clemente**.

Galeichthys felis parental care, **Atz** (4).

DORADIDAE

Megalodoras irwini location of type, **Mead** (3).

PLOTOSIDAE

Plotosus development of skull, **Srinivasachar** (3).

SILURIDAE

Innervation and homology of mandibular musculature, **Stix**.

Callichrous pabda feeding habits, **Moitra** (2).

Parasilurus asotus transitory gland-like cells in barbel, **Sato** & **Yamazaki**.

Rita rita structure of skeleton, **Hashmi**.

Silurus glanis from Italian waters, **Manfredi**; general bionomics, **Mohr**.

Wallago attu formation of oocytes, **Dixit**; breeding and early development, **Mazumdar**, S. R. (2); structure of tongue, **Kapoor** (2); pancreas, **Sinha**.

BAGRIDAE

Species of Haute-Volta, **Daget** (6).

Bagrus bayad, skin, **Al-Hussaini** & **Lufty**.

Chrysichthys auratus, skin, **Al-Hussaini** & **Lufty**.

Mystus chondrocranium, **Srinivasachar** (2); *M. seenghala* formation of oocytes, **Dixit**.

Porcus c.f. *docmac*, neolithic remains, **Daget** (4).

Rita chondrocranium, **Srinivasachar** (2); *R. rita* oogenesis, **Nath**.

AMEIURIDAE

Ameiurus nebulosus food, **Frank** (1); regeneration of taste barbel, **Goss**.

Ictalurus melas new Chilean record, **Buen** (3); *I. punctatus* movements in Des Moines river, **Muncy**.

Noturus gyrinus new Kansas record, **Cross** & **Minckley**.

Pilodictis olivaris age and size, **Cross** & **Hastings**.

SISORIDAE

Glyptothorax key to Indian and Burmese species, **Menon**, M. A. S.; *G. cavia*, *G. telchitta*, recorded from W. Pakistan, **Sufi** (1); *G. manipurensis* sp. nov. Manipur State, India, **Menon**, A. G. K. (1) p. 23 figd.

AMPHILIIDAE

Amphilius atesuensis, **Daget** (6); *A. grammatophorus* distinguishing characters, **Lambert**.

Phractura intermedia, in R. Comoe and nr. Bobo, Haute-Volta, **Daget** (6).

SCHILBEIDAE

Species of Volta system, **Daget (6)**.

Ailia, *Pangasius*, *Silonia* development of chondrocranium, **Srinivasachar (1)**.

Clupisoma garua, *Eutropiichthys vacha* feeding habits, **Motwani & Karamchandani**.

CLARIIDAE

Clariallabes petricola, feeding habits and adaptability, **Corbet (1)**.

Clarias terrestrial locomotion, **Johnels (1)**; *C. anguillaris*, *senegalensis*, variation and possible synonymy, **Daget (6)**; *C. centralis* sp. nov. **Kunungu**, Belgian Congo, **Poll & Lambert** p. 334 figd.; *C. lazera*, skin, **Al-Hussaini & Luffy**; muscles of head and pectoral girdle, **Nawar (1)**; vascular system, **Nawar (2)**; air breathing organs, **Moussa**; *C. vandenhoutei* from French Guinea, **Lambert**.

Heterobranchus of Volta system, **Daget (6)**.

Heteropneustes spawning induced by hormone injection, **Ramaswami & Sundararaj (1)**; *H. fossilis* Weberian ossicles, **Mookerjee & others**; seasonal changes in seminal vesicles, **Sundararaj**; form of cells and coagulation time of blood, **Banerjee**.

Uegitlanis zammaranoi notes on habitat, **Thines (2)**.

Xenoclaris gen. nov. type *Clarias eupogon* Norman, **Greenwood (2)** p. 321; *X. holobranchus* sp. nov. L. Victoria, **Greenwood (2)** p. 322.

MOCHOCIDAE

Species of Haute-Volta, **Daget (6)**.

Chiloglanis brevibarbis redescribed, **Whitehead (1)**; *C. somereni* sp. nov. Nyanza Prov., Kenya, **Whitehead (1)** p. 199 figd.

Microsynodontis polli sp. nov. Gbin river, French Guinea, **Lambert** p. 42 figd.

Synodontis nigriventris, sexual dimorphism, behaviour of young, figs., **Pinter (3)**; *S. schall*, skin, **Al-Hussaini & Luffy**.

MALAPTERURIDAE

Malapterurus electricus, physiology of electric organ, **Augustinsson & Johnels**.

PIMELODIDAE

Chasmocranus brachynema sp. nov. Rio Mogi Guaçu, Brazil, **Gomes & Schubart** p. 143 figd.

CALLICHTHYIDAE

Brochis coeruleus, colour-photo, **Grosse**.

Corydoras schultzei breeding in aquarium, **Hafner**.

LORICARIIDAE

Loricaria? cataphracta Linnaeus's type redescribed, **Wheeler (1)**.

Panaque albomaculatus sp. nov. Ecuador, **Kanazawa (1)** p. 327 figd.

Xenocara dolichoptera, spawning in aquarium, **Lehmann**.

APODES

Key to genera and species of Bombay Coast, **Bal & Mohmed**.

ANGUILLIDAE

Anguilla anguilla use of tidal streams by elvers, **Creutzberg**; behaviour of elvers in tidal estuaries, **Deelder (2)**; movements in North Sea, **Lühmann & Mann (2)**; of Adriatic and Baltic, **Ancona**; growth of in the IJsselmeer, **Deelder (1)**; uniformity of a population, **Thurrow (2)**; plecospondylic vertebral column, **Stolk (1)**; food, **Kubickas**; stone in body cavity, **Tesch**; mortality caused by the parasite *Argulus*, **Soika**; experiments on blood proteins, **Cordier, D. & others (1)**; influence of temperature on thyroid function, **Leloup (2)**; *A. anguilla*, *A. rostrata* life history, **Gordon, B. L.**; *A. bengalensis* bionomics, **Pantulu**; *A. japonica* presumed spawning areas, **Matsui**; blood chemistry, **Sano, T.**; description of thyroid and pituitary, **Honma (3)**; marked by vital staining in neutral red solution, **Kasahara**; *A. marmorata* from South African rivers, **Jubb (1)**; *A. nebulosa labiata*, *A. bicolor bicolor* first record of elvers from African mainland, **Frost**; *A. rostrata* feeding habits, **Godfrey (1)**.

MURAENIDAE

Echidna nocturna new Peruvian record, **Morrow (1)**; *E. nebulosa*, *E. zebra*, *E. polyzona* recorded from Aldabra, **Smith, J. L. B. (9)**.

Fimbrinares mosaica figd., **Whitley (2)**.

Gymnothorax flavimarginatus poisonous effects of flesh, **Ralls & Halstead**; *G. funebris*, *G. moringa* comparison of skull structure, **Burton**; *G. javanicus* recorded from western Indian Ocean, **Smith, J. L. B. (9)**; *G. meleagris*, *G. boschi*, *G. brummeri* recorded from Maldiva Isl., **Palmer**; *G. nevezi* **sp. nov.** Pointe-Noire, E. Africa, **Roux** in **Collignon, Rossignol & Roux** p. 164 figd.; *G. petelli*, *G. undulatus*, *G. flavimarginatus*, *G. richardsoni*, *G. hepatica* recorded from E. Africa, **Smith, J. L. B. (9)**; *G. ruppellii*, *G. meleagris* recorded from Aldabra, **Smith, J. L. B. (9)**.

Muraena insularum new Peruvian record, **Morrow (1)**.

Strophidon brummeri recorded from Aldabra, **Smith, J. L. B. (9)**.

Uropterygius key to Central Pacific species, **Gosline**; *U. inornatus* Oahu, Pacific p. 225 figd., *U. makatei* Tuamotus, Pacific p. 227 figd., **spp. nov.**, **Gosline**; *U. reidi* Schultz a synonym of *U. knighiti*, **Gosline**.

HETERENCHELIDAE

Heterenchelys †regularis **sp. nov.** otolith Miocene Victoria, **Stinton** p. 84 pl. xiii fig. 20.

MORINGUIDAE

Moringua microchir recorded from Aldabra, **Smith, J. L. B. (9)**.

MURAENESOCIDAE

Muraenesox cinereus skeleton, **Jang**; *M. †obrutus* **sp. nov.** otolith Miocene Victoria, **Stinton** p. 83 pl. xiii fig. 2.

NETTASTOMIDAE

Chlopsis bicolor recorded from Taranto Sea, **Parenzan (1)**.

Nettastoma melanura from Algerian coast, **Dieuzeide & Roland (1)**.

Venefica procera recorded from Gulf of Mexico, **Grey (2)**.

CONGRIDAE

Alloconger shiroanago **sp. nov.**, *A. s. shiroanago* **subsp. nov.** off Owashi and Wakasa Bay, Japan p. 193 fig. 2 and *A. s. major* **subsp. nov.** off Shibushi and off Owashi, p. 191 fig. 1, **Asano (1)**.

Ariosoma anago recorded from Aldabra, **Smith, J. L. B. (9)**; *A. gilberti* status

and synonymy, **Rosenblatt**; *A. vomerina* Myers & Wade a synonym of *A. gilberti* (Ogilby), **Rosenblatt**.

Astroconger myriaster vertebral characters, **Takagi & Kobayashi**; *A. †rosstratus* **sp. nov.** Otolith Oligocene Victoria, **Stinton** p. 83 pl. xiii fig. 16.

Conger key to species, **Kanazawa (2)**; *C. cinereus* recorded from Aldabra, **Smith, J. L. B. (9)**; *C. conger* experiments on sexual maturation, **Mousset**; *C. †elliptica* **sp. nov.** otolith Oligocene Lower Rhine p. 329 pl. i figs. 13, 14; *C. †triangulata* **sp. nov.** Miocene Lower Rhine p. 330 pl. i fig. 15, **Weiler (1)**; *C. japonica* Bleeker a synonym of *C. myriaster*, **Kanazawa (2)**; *C. jordani* Japan p. 250 figd., *C. oligoporus* Hawaii p. 251 figd., *C. macrocephalus* Philippines p. 254 figd., *C. philippinus* Philippines p. 255 figd., **spp. nov.**, **Kanazawa (2)**; *C. triporiceps* **sp. nov.** Brazil, **Kanazawa (2)** p. 243 figd.

Heteroconger longissimus habitat and behaviour, **Bauchot & Bassot**.

Japonoconger **gen. nov.** type *Arisoma sivicola* Matsubara & Ochiai, **Asano (3)** p. 316.

Leptocephalus kiiensis **Ui** a synonym of *Conger myriaster*, **Kanazawa (2)**; *L. microphthalmus*, location of type **Mead (3)**.

Nystactichthys **nom. nov.** for *Nystactes* Böhlke pre-occ., **Böhlke (1)**.

Promyllantor nezumi **sp. nov.** Owashi, Japan, **Asano (2)** p. 198 figd.

Rhynchoconger brachyuata **sp. nov.** Taipei, **Chu & Chen** p. 127 figd.

Rhynchocymba nystromi ginanago **subsp. nov.** Owashi, Japan, **Asano (2)** p. 197 figd.

Thyreconger **Wade** a synonym of *Ariosoma* Swainson, **Rosenblatt**; *T. hemiaspidus* **Wade** a synonym of *Ariosoma gilberti* (Ogilby), **Rosenblatt**.

Uroconger †rectus otoliths figd. Miocene-Pliocene Victoria, **Stinton**.

ECHELIDAE

Eomyrophis **nom. nov.** for *Eomyrus* Eastman 1905 pre. occ., **Whitley (1)** p. 44.

Arenichthys apterus location of type, **Mead (3)**.

Muraenichthys godeffroyi figd., **Whitley** (2); *M. gymnopterus* recorded from Bombay coast, **Bal & Mohmed**; *M. laticauda*, *M. schultzi* recorded from Aldabra, **Smith, J. L. B.** (9); *M. xorae* sp. nov. Xora mouth, S. Africa, **Smith, J. L. B.** (12) p. 126 figd.

Myrophis uropterus new Western Indian Ocean record, **Smith, J. L. B.** (9).

OPHICHTHIDAE

Bascanichthys scuticaris from Cedar Key, Florida, **Caldwell** (2).

Brachysomophis crocodilinus recorded from Aldabra, **Smith, J. L. B.** (8).

Caecula pantherina sp. nov. W. Africa, **Cadenat** (1) p. 1267 figd.

Callechelys key to western Indian Ocean species, **Smith, J. L. B.** (8); *C. bitaeniatus*, *C. marmoratus* recorded from Aldabra, **Smith, J. L. B.** (8); *C. canaliculatus* Pinda, p. 836 figd., *C. striatus* Mozambique p. 838 figd., spp. nov., **Smith, J. L. B.** (8).

Jenkinsiella playfairii recorded from Kenya and Mozambique, **Smith, J. L. B.** (8).

Leiuranus semicinctus recorded from Maldiva Isl., **Palmer**; *L. semicinctus*, *L. phoenixensis* recorded from Aldabra, **Smith, J. L. B.** (8).

Myrichthys maculosus, *M. colubrinus* recorded from Aldabra, **Smith, J. L. B.** (8); *M. tigrinus* new Peruvian record, **Morrow** (1).

Mystriophis intertinctus from Cedar Key, Florida, **Caldwell** (2).

Ophichthus arenicola Klunzinger a synonym of *Jenkinsiella playfairii* (Günther), **Smith, J. L. B.** (8); *O. marginatus* recorded from Aldabra, **Smith, J. L. B.** (8).

Ophichthys cephalozona, *O. apicalis* recorded from Bombay coast, **Bal & Mohmed**; *O. semicinctus* recorded from Algerian coast, **Dieuzeide & Roland** (2).

Phyllophichthus xenodontus recorded from western Indian Ocean, **Smith, J. L. B.** (8).

Pisoodonophis cancrivorus recorded from Bombay Coast, **Bal & Mohmed**.

Quassinemus goslingi. location of type **Mead** (3).

Syletophis nom. nov. for *Syletor* Jordan 1918 pre-occ., **Whitley** (1) p. 44.

HETEROMI

HALOSAURIDAE

Halosaurus underwater photo, **Houot**

NOTACANTHIDAE

† *Pronotacanthus sakel-almæ* figd., Oligocene Roumania, **Jonet**.

SYNENTOGNATHI

BELONIDAE

Belone † *tenuis* and *B. meneliticus* figd., **Jonet**.

SCOMBRESOCIDAE

Cololabis saira distribution in Pacific, **Birman**; estimation of migrations, **Doi**.

Scomberesox saurus winter strandings on E. Anglian and Dutch Coasts, **Atkinson**; aggregation off Walcheren, **Walrecht**.

HEMIRHAMPHIDAE

Chriodorus atherinoides new Cuban record, **Duarte-Bello & Suarez-Caabro**.

† *Cyclolepis stenodinus* synonym of † *Hemilampronites hesperius*, figd. **Dunkle**.

Dermogenys pusillus, a fish of acid waters, **Johnson**.

Hyporhamphus gilli, *H. snyderi* new Peruvian records, **Morrow** (1).

Reporhamphus melanochir age and growth, **Ling**.

EXOCEETIDAE

Cypselurus key to Indian species, with notes, **Chandy** (2); *C. antarei*, location of type, **Mead** (3); *C. coromandelensis* redescribed, **Chandy** (2); *C. exsiliens*, *C. oligolepis* new Indian records, **Chandy** (2); *C. starksi* new for Echigo Province, Japan, **Honma** (1).

Exonautes marginatus, *E. nonsuchae*, location of types, **Mead** (3).

Fodiator acutus new Peruvian record, **Morrow** (1).

MICROCYPRINI

AMBLYOPSIDAE

Phylogeny, distribution and key to species, **Woods & Inger**.

CYPRINODONTIDAE

Origin, evolution, distribution and taxonomy of Cuban Poeciliids, **Rivas**; bionomics of Texan marine forms, **Simpson & Gunter**; species of Haute-Volta, **Daget** (6); frontal scalation

pattern, **Hoedeman** (2); localities of Nile species, **Sandon**; scales from sediment core in Connecticut, **Lagler & Vallentyne**; genetics of fin transplantation, **Kallman & Gordon** (2).

Aphanius iberus biometric study, **Lozano Cabo** (2); see also *Cyprinodon*.

Aphyosemion bivittatum, pseudo-pairing between males, **Nieuwenhuizen** (1); *A. guineense geryi* subsp. nov. **Conakry-Dubreka, French Guinea, Lambert** p. 52 figd.

Austrofundulus myersi sp. nov. Northern Colombia, **Dahl** p. 42.

Cynolebias ladigesi, breeding behaviour, drought requirements of eggs, comparison with other species, photos, **Foersch**; colour-photo, **Schroeter** in **Foersch**; *C. whitei* breeding habits, **Carvalho, A. L. de** (1) & (2).

Cynopoecilus, structure of egg, **Siegel**.

Cyprinodon bondi, location of type, **Mead** (3); *C. fasciatus* and *C. iberus*, localities in France, **Arnoult**; *C. macularius* mortality from high salinity, **Barlow**.

Fundulus brain size and functional regulation, **Oppenheimer & Vassady**; duration of sperm function, **Hubbs, Clark & Drewry**; extended viability of eggs, **Harrington & Haeger**; *F. heteroclitus* regeneration of fins, **Goss & Stagg**; *F. hispanicus* locality in France, **Arnoult**; *F. nolti* geographic variation, **Brown**.

Gambusia osteology of fins, **Franca, P. & M. de L.** (3); *G. affinis holbrooki* cannibalism, **Abdullayev**; *G. beebei*, location of type, **Mead** (3); *G. holbrooki* axial skeleton, **Franca, P. da & M. de L.** (2); study of a Portuguese population, **Franca, P. da & M. de L.** (1); neo-formation of vitamin A₂ after administration of B-carotene or vitamin A₁, **Grangaud & Moatti**; *G. senilis* new record for United States, **Hubbs, Clark** (3).

Heterandria formosa development and growth compared with other Cyprinodonts, **Wellensiek**.

Hubbsina turneri adaptations during gestation, **Mendoza**.

Hypsopanchax silvestris sp. nov. Lusambila river, Belgian Congo, **Poll & Lambert** p. 328 figd.

Lebistes reticulatus gonopodial suspensorium, **Mohsen** (1); features of fertilization, **Ghenin**; hermaphroditism with self-fertilization, **Spurway** (1); orientating rotation of the egg, **Clavert & Filogamo** (2); *L. reticulatus* × *Mollienisia sphenops* melanoma, **Stolk** (9).

Mollienisia velifera tumour of pituitary gland, **Stolk** (7).

Nothobranchius guentheri, colour-photo., **Hoppe**; spawning in aquarium, **Friese**.

Oryzias latipes mating behaviour, **Ono & Uematsu**; sexual differences in some bones, **Egami & Ishii**; hormone induced sex-reversal, **Yamamoto, T. S.** (1); effect of hormone on tooth size, **Egami** (4); *O. melastigma* development of kidney, **Rangarajan**.

†*Pachylebias formosus* sp. nov. Oligocene Roumania **Jonet** p. 42 pl. viii fig. 1 pl. 14 fig. 7.

Pachypanchax homalonotus, spawning in aquarium, photos, **Nieuwenhuizen** (2).

Panchax grahmi var. *decemfasciata* = *Epiplatys senegalensis*, **Daget** (6).

Pterolebias elegans sp. nov., Cabo Frio nr. Rio de Janeiro, **Ladiges** (2); *P. longipinnis*, structure of egg, **Siegel**.

Rachovia splendens sp. nov. Northern Colombia, **Dahl** p. 43.

Rivulus review of Antilles species, **Hoedeman** (3); *R. marmoratus* redescription, **Harrington & Rivas**; *R. marmoratus bonairensis* subsp. nov., Antilles, **Hoedeman** (3) p. 117.

Toxus serripennis sp. nov. Cuba, **Rivas** p. 283 figd.

Valencia see *Fundulus*.

SOLENICHTHYES

FISTULARIIDAE

Fistularia aff. †*koenigi* figd., **Jonet**.

CENTRISCIDAE

†*Amphisile teleajensis* figd., **Jonet**.

SYNGNATHIDAE

Corythoichthys bermudensis, location of type, **Mead** (3); *C. fasciatus* recorded from Maldive Isl., **Palmer**; new for Echigo Province, Japan, **Honma** (1).

Hippocampus development of chondrocranium, **Kadam**; *H. hudsonius punctulatus* new Venezuelan record, **Martin, S. F.** (1); *H. zosterae* life history, **Strawn**.

Syngnathus mackayi nesiotes; *S. pipulus*, location of types, Mead (3); *S. pelagicus* from Texas waters, Springer & Hoese.

Urocampus rikuzenius new for Echigo Province, Japan, Honma (1).

ANACANTHINI

MACROURIDAE

Chalinura murrayi recorded from Western Atlantic, Grey (2).

Coelorhynchus felevatus otoliths figd. Miocene Victoria, Stinton.

MERLUCCIIDAE

Merluccius †fimbriatus sp. nov. otolith Miocene Victoria, Stinton p. 84 pl. xiii fig. 27; *M. merluccius* growth in Mediterranean, Matta (4); growth study, Matta (1).

GADIDAE

Arctogadus glacialis new to Russian fauna, Andriyashev (2).

Bregmaceros †minus sp. nov. Miocene Victoria, Stinton p. 85 pl. xiii fig. 22; *B. †prahovanus* sp. nov. Oligocene Roumania, Jonet p. 78 pl. vii figs. 3, 8.

Eleginus distribution, Pokrovskaya (2); *E. gracilis* new to Echigo Province Japan, Honma (1).

Gadus effect of wind and current on movements of larvae, Hill & Lee; feeding habits in E. Murman, Zhabreva; *G. callarias* southernmost range, Wise (2); age and growth in Karsk Sea, Pokrovskaya (1); movements of Arcto-Norwegian stock, Trout (1); investigations on Bornholm Basin stocks, Zukowski; study on Oslo Fjord population, Otterbech; population study, Jonsson; distribution in Newfoundland and Labrador waters, Templeman (2); factors influencing size of year class, Wiborg; reproduction and food, Powles; effect of temperature on growth, Taylor (2); effect of low temperature on osmo-regulation, Woodhead; spawning behaviour, Templeman (1); *G. macrocephalus* occurrence off Southern California, Phillips, J. B. (3); *G. poutassou* new Moroccan record, Furnestin & others; *G. †refectus* sp. nov. otolith Oligocene Victoria, Stinton p. 85 pl. xiii figs. 7, 15.

Lota lota growth, Müller, W.

Melanogrammus aeglefinus, validity of otolith age determinations, Kohler;

drumming muscles of swimbladder, Templeman & Hodder; growth rate, Wise (1).

Melanonus unipennis, location of type, Mead (3).

Mora mediterranea from Algerian coast, Dieuzeide & Roland (1).

†*Nemopteryx athanasii* and *N. aff. leptosomus* figd., Jonet.

†*Paratichthys* gen. nov. type *Petalolepis fibrillatus* Cockerell, Cretaceous Wyoming. Dunkle U.

Ot. (*Gadidarum*) †*minusculas*, *sarmatus* figd. Miocene Azerbaijan, Pobedina et al.

ALLOTRIIGNATHI

LAMPRIDAE

Lampris luna Cuban specimen, Rivero; *L. regius*, Whitley (8).

TRACHIPTERIDAE

Trachipterus cristatus large example from Ligurian Sea, Tortonese (8); *T. ishikawai* from Suruga Bay, Kuroda (2).

BERYCOMORPHI

BERYCIDAE

Beryx decadactylus new Tasmanian record, Olsen; *B. splendens*, *B. decadactylus* Western North Atlantic records, Scattergood.

†*Dictynopterus* Whitley 1951 redundant, Trewavas (1).

Ot. (*Berycidarum*) cf. †*splendidus* figd. Miocene Azerbaijan, Pobedina et al.

TRACHYBERYCIDAE

Relationships, Mead & Maul.

CARISTIIDAE

Caristius macropus from Sagami Bay, Japan, Tomiyama.

TRACHICHTHYIDAE

Hoplostethus pacificus new Peruvian record, Morrow (2).

Trachichthodes †salebrosus sp. nov. otoliths Oligocene-Miocene Victoria, Stinton p. 87 pl. xiii figs. 19, 24, 28.

Trachichthys prosthemi luminous organ, Haneda.

MONOCENTRIDAE

Cleidopus †cavernosus sp. nov. Otolith Oligocene Victoria, Stinton p. 87 pl. xiii fig. 26.

Monocentris †sphaeroides sp. nov. Otolith Pliocene S. Australia, Stinton p. 86 pl. xiii fig. 25.

HOLOCENTRIDAE

Holocentrus spiniferus recorded from S. Africa, Smith, J. L. B. (12).

MELAMPHAIDAE

Melamphaes typhlops, *M. mizolepis*, *M. macrocephalus*, *M. bispinosus* new Peruvian records, Morrow (2).

ZEOMORPHI

ZEIDAE

Neocyttus rhomboidalis var. *gibbosus* new Tasmanian record, Olsen.

Zeus faber turning in a vertical plane, Aleev (2); feeding in aquaria, Wilson; *Z. †hoernesii* figd., Jonet.

CAPROIDAE

Antigonia combatia sp. nov. Florida, Berry & Rathjen p. 255 figd.

Capros †radobojanus and *C. †longirostris* figd., Jonet.

PERCOMORPHI

PERCOIDEA

†“*Percidarum*” *clivorum* sp. nov. Otolith Miocene Victoria, Stinton p. 88 pl. xiii fig. 18.

SERRANIDAE

Acanthistius sebastoides recorded from Mozambique, Smith, J. L. B. (12).

Anthias pulchellus new Tasmanian record, Olsen.

Cephalopholis igarashiensis sp. nov. Japan, Katayama (2) p. 156 figd.

Cerna sicanus Döderlein a synonym of *Epinephelus caninus* or *E. goreensis*, Tortonese (2).

Dermatolepis marmoratus sp. nov. Florida, Osburn & Mowbray p. 1 figd.

Epinephelus clarkei sp. nov. Xora river, S. Africa, Smith, J. L. B. (12) p. 124 figd.; *E. diacanthus amblycephalus* from Kochi Prefecture, Japan, Kamohara (1); *E. nigratus* does not occur in Mediterranean, Tortonese (2); *E. truncatus* sp. nov. Japan, Katayama (2) p. 158 figd.

Grammistes lineatus sp. nov. Aldabra, Arnoult in Arnoult & others p. 62 figd.

Holanthias borbonius new to Japan, Katayama (1).

Lateolabrax latus sp. nov. Japan, Katayama (2) p. 154 figd.

Lepibema chrysops annual variation in Grand Lakes, Vladkyov & Beaulieu.

Morone americana variation in abundance in Great Lakes, Vladkyov & Beaulieu; *M. chrysops* structure of alimentary canal, Sublette; *M. interrupta* age and growth, Schoffman (2).

Mycteroperca roquensis sp. nov. Los Roques, Venezuela, Martin, S. F. (1) p. 100.

Neoscombrops analis sp. nov. Japan, Katayama (2) p. 153 figd.

Pikea cubensis sp. nov. Cuba, Schultz, L. P. (3) p. 322 figd.; *P. mexicanus* sp. nov. Gulf of Mexico p. 323 figd.; *P. mexicanus atlanticus* subsp. nov. French Guiana p. 326, Schultz, L. P. (3).

Plectranthias anthioides new to Japan, Katayama (1).

Plectropoma maculatum occurrence in Arabian Sea, Chandy (1).

Promicrops ditobo description, Roux in Collignon, Rossignol & Roux.

Pseudogramma polyacantha new to Japan, Katayama (1).

Roccus saxatilis New Jersey populations, Raney (1); population studies, Raney & Woolcott; Raney & others; subpopulations, Raney (2).

Rypticus bornoi, location of type, Mead (3).

Serranus budensis and *S. simionescui* figd., Jonet.

CENTRARCHIDAE

Huro salmoides acclimatization in Brazil, Azevedo.

Lepomis macrochirus results of fin clipping on behaviour and growth, Crawford; *L. macrochirus*, *L. gibbosus* growth, Costanzo.

Micropterus salmoides in Slovakian Danube, Mišik (1).

Pomoxis nigromaculatus, *P. annularis* comparison of skeleton, Hofstetter & others (2).

PRIACANTHIDAE

Parapriacanthus beryciformis luminescence, Haneda & Johnson; *Priacanthus* (*Apostosis*) *†sturi* figd., Jonet.

Pristigenys Agassiz 1835 to replace *Pseudopriacanthus* Bleeker, Myers (2).

Pseudopriacanthus Bleeker a synonym; see *Pristigenys*.

APOGONIDAE

Apogon aterrimus figd., Whitley (2); *A. ellioti* description of luminous organs, Iwai & Asano; *A. marginatus* Döderlein a synonym of *A. ellioti* Day, Iwai & Asano; *A. noumeae* sp. nov. New Caledonia, Whitley (2) p. 33; *A. pigmentarius* from Cedar Key, Florida, Caldwell (2).

Apogonichthys, status in doubt, Iwai & Asano; *A. stellatus* new Venezuelan record, Martin, S. F. (1).

Gymnapogon japonicus new for Echigo Province, Japan, Honma (1); from Kochi Prefecture, Japan, Kamohara (1).

Siphamia majimae sp. nov. Japan, Matsubara & Iwai (1) p. 603 figd.; *S. versicolor* luminous organ, Iwai (2).

PERCIDAE

Breeding habits of *Etheostomatinae*, Winn (1).

Reproductive behaviour and ecology of *Etheostomatinae*, Winn (2); hybrid survival in *Etheostominae*, Hubbs, Clark & Strawn.

Aspro streber from N.E. Slovakia, Kux & Weisz.

Etheostoma radiosum cyanorum, *E. spectabile* spawning and hybridization, Linder; *E. spectabile*, egg numbers, Hubbs, Clark (2); *E. spectabile* × *E. lepidum* fertility of F₁ hybrids, Hubbs, Clark (1); *E. stigmaeum* new Kansas record, Cross & Minckley.

Lucioperca lucioperca innervation of alimentary tract, Kusminskaya; fluctuation of stock, Wiktor; *L. sandra* introduction into British waters, Mansfield; feeding coefficient, Biely (1); first year growth, Biely (2).

Perca fluviatilis age and growth, Frank (3); growth study, Le Cren (1); gill arches and lamellae compared with *Pleuronectes*, Byczkowska-Smyk; receptor neurones of digestive tract, Milochin (1); nerve plexus of digestive tract, Milochin (2); spawning behaviour, Fabricius; visual perception of movement, Boulet; colour-photo, Pinter (1); *P. fluviatilis vulgaris* × *Lucioperca lucioperca* hybrids, Balon (3).

Percina caprodes, egg numbers, Hubbs, Clark (2).

† *Properca paucae* figd., Jonet.

Romanichthys gen. nov. p. 225 type *R. valsanicola* sp. nov. p. 226 figd., Roumania, Dumitrescu & others.

Stizostedion canadense canadense age and growth, Hassler (1); fecundity, sex ratio and maturity, Hassler (2).

† *Ot. (Percidarum) sigmoilinoideus* sp. nov. Miocene Azerbaijan Pobedina et al. p. 179 pl. xxviii fig. 3.

LATILIDAE

Branchiostegus semifasciatus new Moroccan record, Furnestin & others.

Caulolatilus guppyi, location of type, Mead (3).

Dikellorhynchus, *Malacanthus* relationships and key to species, Berry (3); *D. incredibilis* Smith a prejuvenile of *Malacanthus hoedtii* Bleeker, Hubbs, C. L. (3); *D. tropidolepis* sp. nov. Western North Atlantic, Berry (3) p. 117 figd.

Malacanthus hoedtii new record for New South Wales, Whitley (2).

SILLAGINIDAE

Sillago † *pliocenica* figd. Oligocene-Miocene Victoria, Stinton.

LACTARIIDAE

Lactarius † *tumulatus* sp. nov. Otolith Miocene Victoria, Stinton p. 88 pl. xiii fig. 5.

CARANGIDAE

Keys to E. African genera and species, Williams, F.

Atule malam Bleeker a synonym of *A. djeddaba* (Forsk.), Williams, F.

Carangoides rectipinnus sp. nov. Zanzibar, Williams, F. p. 401 figd.

Caranx (*Atule*) *pectoralis* sp. nov. South China Sea, Chu & Cheng p. 316 figd.; *C. bartholomaei* new Venezuelan record, Martin, S., F. (1); *C. crysos* early development and distribution, McKenney & others; *C. ruber* recorded from Cedar Key, Florida, Berry (1); *C. trecae* new Moroccan record, Furnestin & others.

Chorinemus hainanensis sp. nov. South China Sea, Chu & Cheng p. 317 figd.

Decapterus kurroides aka-adsii subsp. nov. Sagami Bay, Abe p. 716; *D. punctatus* from Venezuela, Martin, S. F. (3).

Oligoplites refulgens new Peruvian record, **Morrow** (1).

Seriola dumerili recorded from Cedar Key, Florida, **Berry** (1); *S. quinqueradiata* early development, **Uchida & others** (2); **Mitani** (1); maturity and spawning, **Mitani** (2); *S. zonata* recorded from Cedar Key, Florida, **Berry** (2).

Suareus gen. nov. type *Caranx suareus* Risso, **Furnestin & others** p. 444; *S. furnestini* sp. nov. Morocco, **Furnestin & others** p. 445 figd.

Trachurops crumenophthalmus new Peruvian record, **Morrow** (1).

Trachurus japonicus spawning season and place, **Hotta & Tamura**; *T. trachurus* predation by sea-birds, **Davies** (1); *T. †sanzi* sp. nov. otolith Pliocene Majorca, **Bauzá Rullañ** (1).

Vomer setapinnis from Cedar Key, Florida, **Caldwell** (2).

MENIDAE

Mene maculata recorded from New South Wales, **Whitley** (2).

BRAMIDAE

Brama japonica distribution in Pacific, **Birman**.

Lepidotus australis synonymy, **Buen** (2).

Taractes key to species, **Mead & Maul**; *T. (Taractichthys)* subgen. nov. type *Brama longipinnis* Lowe, **Mead & Maul** p. 407; *T. steindachneri* description of juvenile example, **Okada & Suzuki** (2).

Taractichthys subgen. nov. of *Taractes* q.v.

STEINEGERIIDAE

Relationships, **Mead & Maul**.

CENTROPOMIDAE

Ambassis gymnocephalus development of eggs and larvae, **Nair** (1); *A. lala*, spawning, **Hartel** (1).

Lates niloticus growth in Egypt, **Jensen**.

EMMELICHTHYIDAE

Schultzea gen. nov. p. 249 type *S. campechanus* sp. nov. Gulf of Mexico p. 250 figd., **Woods**.

LUTJANIDAE

Lutjanus guttatus new Peruvian record, **Morrow** (1).

LEIOGNATHIDAE

Eucinostomus californiensis, *E. elongatus* new Peruvian records, **Morrow** (1); *E. havana*, *E. lefroyi* new Venezuelan records, **Martin**, S. F. (1); *E. mowbrayi* location of type, **Mead** (3).

POMADASYIDAE

Anisotremus virginicus new Venezuelan record, **Martin**, S. F. (1).

Bathystoma a. aurolineatum new Venezuelan record, **Martin**, S. F. (1).

Haemulon parra new Venezuelan record, **Martin**, S. F. (1).

Otoperca aurita new Moroccan record, **Furnestin & others**.

Plectorhynchus chaetodonoides, disruptive colour, **Atz** (2).

Pluchus chubbi description of adult, **Smith**, J. L. B. (12).

SCIAENIDAE

Corvina †rhenana sp. nov. otolith Miocene Lower Rhine, **Weiler** (1) p. 340 pl. ii figs. 22, 23.

Cynoscion macdonaldi growth study and fishery, **Berdeque** (1).

Kroseriphus nom. nov. for *Seriphus* Ayres 1857 and 1860 pre-occ., **Whitley** (1) p. 44.

Micropogon undulatus, bionomics, **Suttkus** (1).

Ophioscion costaricensis sp. nov. Costa Rica, **Caldwell** (4) p. 117 figd.

Otolithus senegalensis new Moroccan record, **Furnestin & others**.

Sciaenops ocellata description of a blind specimen, **Gunter** (1).

Ot. (Sciaenidarum) †robustus sp. nov. Miocene Azerbaijan, **Pobedina et al.** p. 178 pl. xxviii fig. 1.

MULLIDAE

Mullus barbatus of Gulf of Iskenderun, **Akyüz**; growth, **Bougis & Muzinic**.

SPARIDAE

Orbital bones of Japanese species, **Akazaki**.

Archosargus oviceps, *A. probatocephalus* comparison of colour pattern, **Caldwell** (5).

Chrysophrys auratus growth study, **Mathias & Salvy**; variations in growth rate, **Longhurst** (2); weight/length data, **Cassie**.

Dentex polli description, Roux in Collignon, Rossignol & Roux.

Diplodus tooth figd. Pliocene Florida, Caldwell (3).

Labeo nom. nov. for *Labeo* Bowdich 1825 pre-occ., Whitley (1) p. 44.

Lagodon rhomboides biology and systematics, Caldwell.

Pagellus erythrinus figd. from Miocene Ukraine, Tarashchuk.

†*Rhamnubia* Whitley 1951 redundant, Trewavas (1).

Sargus tjomnitanus teeth figd. Neogene France, Leriche.

Spondyllosoma cantharus breeding habits, Wilson.

Ot. (*Sparidarum*) †*meoticus* sp. nov. Miocene Azerbaijan, Pobedina et al. p. 175 pl. xxvii fig. 1.

MAENIDAE

Spicara biometric study, Dieuzeide & Roland (3).

TOXOTIDAE

Toxotes jaculatrix, structure of mouth, eye, behaviour, Lüling (5); presence of melanophores in head region of embryos, Lüling (3).

GIRELLIDAE

Girella nigricans homing behaviour, Williams, G. C.; *G. punctata* early development, Mito.

Guichenotia nom. nov. for *Glyphodes* Guichenot 1862 pre-occ., Whitley (1) p. 44.

CHAETODONTIDAE

Key to Venezuelan genera, Martin, S. F. (1).

Angelichthys ciliaris new Venezuelan record, Martin, S. F. (1);

Chaetodon capistratus recorded from Venezuela, Martin, S. F. (3); *C. falcifer* sp. nov. Baja California, Hubbs & Rechnitzer p. 275 figd.; *C. lunula* from Kochi Prefecture, Japan, Kamohara (1).

Holacanthus isabelita from Texas waters, Springer & Hoese.

Microcanthus strigatus algal feeding, Martin, M. & Winks.

Pomacanthus arcuatus, *P. paru* new Venezuelan records, Martin, S. F. (1).

NANDIDAE

Badis badis, colour changes, breeding behaviour, Nieuwenhuizen (4).

Monocirrhus, breeding habits, Gordon, M. (2); *M. polyacanthus* recorded from Venezuela, Ramirez, E.; parasites, Geus.

CICHLIDAE

Species of Haute-Volta, Daget (6); behaviour patterns, Oehlert.

Aequidens latifrons breeding, Lorec; *A. maronii*, Taborski; *A. tetramerus* systematic study, Travassos & Pinto (2).

Apistogramma reitzigi, breeding in aquarium, care of young, colour-change, Kuenzer (1); parental care, Butz & Kuenzer.

Cichlasoma haitiensis, location of type, Mead (3); *C. severum*, pair-formation, Schröder.

Crenicara filamentosa sp. nov. Amazon?, Ladiges (3), p. 204 figs.; *C. praetoriusi* = *C. maculata*, Ladiges (3).

Crenicichla saxatilis, Linnaeus's type redescribed, Wheeler (1).

Eetroplus maculatus salinity tolerance, Pampapathi Rao.

Geophagus brasiliensis, *Crenicichla jaguarensis* comparison of opercular bones, Travassos & Pinto (1); *G. jurupari* oral incubation, Reid, M. J. & Atz.

Haplochromis multicolor, breeding, number of young, Kibbat.

Hemichromis bimaculatus, behaviour, Spatz; colour-photo, Grosse in Spatz; *H. fasciatus*, urogenital papilla Mathieu; breeding, Rohrberg.

Nannacara anomala parental care, Butz & Kuenzer.

Parvacara, Whitley 1951 redundant, Trewavas (1).

Stappersetta nom. nov. for *Stappersia* Boulenger 1914 pre-occ., Whitley (1) p. 44.

Steatocranus casuarius bionomics, Wickler (4).

Symphysodon discus, spawning, parental relationship, colour-change, Weingarten; spawning habits, Gordon, M. (4); behaviour of fry, Gordon, M. (3).

Teleogramma gracile, colour and behaviour, Ladiges (4).

Tilapia culture of, **Chimits**; *T. esculenta*, calcium metabolism and rings on scales, **Garrod & Newell**; *T. karomo*, *T. variabilis* breeding behaviour, **Lowe (1)**; *T. mossambica* production in Thailand, **Pongsuwana**; introduction and acclimatization, breeding, photos of sexes, "nests" and young, **Atz (1)**; breeding behaviour photographed, **Schapitz (2)**; diurnal movements, **Maruyama**; *T. nilotica* bionomics, **Lowe (2)**; enzymes, **Keddis**; structure of pancreas, **Naguib**; thyroid, thymus, pancreas, gonads, **Al-Hussaini & Rizkalla (1-4)**; *T. nilotica*, *galilaea*, *zillii*, age and growth, **Jensen**; *T. zillii*, introduction in Hawaii, **Atz (3)**; *T. zillii*, *T. galilaea*, *T. macrochir* sex determination, **Mathieu**.

CEPOLIDAE

Owstonia grammodon now placed in this family, **Okada & Suzuki (1)**.

Pseudocepola taeniosoma now placed in this family, **Okada & Suzuki (1)**.

CIRRHITIDAE

Cirrhitichthys corallicola, location of type, **Mead (3)**.

POMACENTRIDAE

Abudefduf analogus new Peruvian record, **Morrow (1)**; *A. septemfasciatus* from Kochi Prefecture, Japan, **Kamohara (1)**.

Amphiprion chrysogaster new Australian record, **Whitley (2)**; *A. percula* behavioural mechanisms in association with *Stoichactis*, **Davenport & Norris**.

Chromis caeruleus, behaviour of young in association with coral, **Klausewitz (4)**; *C. notatus* eggs and larvae, **Fujita (1)**.

Dascyllus aruanus, *marginatus*, habitat and behaviour, **Klausewitz (4)**; *D. trimaculatus*, spawning and early development, **Koenig**.

Eupomacentrus beebei; *E. rubridorsalis*, location of types, **Mead (3)**.

Pomacentrus freemani, location of type, **Mead (3)**; *P. fuscus* new Venezuelan record, **Martin, S. F. (1)**.

Pseudochromis aldabraensis sp. nov. Aldabra, **Bauchot-Boutin** in **Arnoult & others** p. 80 figd.

LABRIDAE

Keys to genera and species from Kochi Prefecture, Japan, **Kamohara (3)**.

Anampses key to Hawaiian species, **Randall (2)**; *A. chrysocephalus* p. 100 figd., *A. rubrocaudatus* p. 103 figd., spp. nov. Hawaii, **Randall (2)**.

Callyodon mutabilis, Gronovius type redescribed, **Wheeler (1)**.

Choerodonoides japonicus gen. et sp. nov. Japan, **Kamohara (3)** p. 2 figd.

Coris giofredi a sexual form of *C. julis*, **Bacci & Razzauti (1) & (2)**.

Crenilabrus evaluation of species, *C. melanocercus* Risso a synonym of *C. tinca* Brünich, *C. quinque maculatus* Bloch a synonym of *C. ocellatus* Forskål, **Serra & Albuquerque**.

Fowlerella = *Labroides*, **Randall (3)**.

Gomphosus tricolor dimorphic form of *G. varius*, **Strasburg & Hiatt**.

Guntheria key to Australian species, **Whitley (2)**; *G. vestalis* sp. nov. Queensland, **Whitley (2)** p. 37.

Halichoeres bivittatus from Texas waters, **Springer & Hoese**.

Iridio bathyphilus, location of type, **Mead (3)**.

Labrichthys cyanotaenia, synonyms, **Randall (3)**.

†*Labrodon pavementatum* pharyngeal teeth figd. Neogene France, **Leriche**.

Labroides key to species, with ecological notes, **Randall (3)**; *L. phthirophagus* p. 337 figd., Hawaiian Isl., *L. rubrolabiatus* p. 342 figd., Society Isl., spp. nov., **Randall (3)**.

Labrus bergyllta blood proteins, **Fine & Drilhon**; *L. mixtus* carotenoid content differing with sex, **Abolins**; *L. ossifagus* sexual display, **Wilson**. "L." *quadrilineatus*, not a *Labroides*, **Randall (3)**.

Pseudolabrus notatus sp. nov. Japan, **Kamohara (3)** p. 8 figd.

†*Stylodus lebescontei* pharyngeal teeth figd. Neogene France, **Leriche**.

Suezichthys nom. nov. for *Suezia* Smith, pre-occupied, **Smith, J. L. B. (14)**.

†*Taurinichthys miocenicus* pharyngeal teeth figd. Neogene France, **Leriche**.

SCARIDAE

Keys to genera and species, **Schultz, L. P. (1)**; sexual dimorphism, **Winn & Bardach**.

Pseudoscarus guacamaia new Venezuelan record, **Martin, S. F. (1).**

Scaridea leucotaeniata Fowler a juvenile *Scarus sordidus* Forskål, **Schultz, L. P. (1).**

Scarops gen. et subgen. nov. type *Scarus rubroviolaceus* Bleeker, **Schultz, L. P. (1)**; *S. (Xenoscarops)* subgen. nov. type *Scarus perrico* Jordan & Gilbert, **Schultz, L. P. (1) p. 23.**

Scarus (Ypsiscarus) subgen. nov. type *Callyodon oedema* Snyder, **Schultz, L. P. (1) p. 47**; *S. atropectoralis* sp. nov. Celebes, **Schultz, L. P. (1) p. 79 figd.**; *S. flavipectoralis* sp. nov. Luzon, Philippines, **Schultz, L. P. (1) p. 52 figd.**; *S. marshalli* sp. nov. Red Sea, **Schultz, L. P. (1) p. 88 figd.**; *S. punctatus* C. & V. a synonym of *S. croicensis*, **Winn & Bardach**; *S. randalli* sp. nov. Onotoa Atoll, **Schultz, L. P. (1) p. 97 figd.**

Sparisoma abilgaardi a synonym of *S. viride*, **Winn & Bardach**; *S. chrysotermum*, *S. aurofrenatum* new Venezuelan records, **Martin, S. F. (1)**; *S. distinctum* Poey a synonym of *S. aurofrenatum*, **Winn & Bardach.**

Xenoscarops subgen. nov. of *Scarus* q.v.

Xenoscarus hubbsi Harry a synonym of *Nicholsina denticulatus*, **Schultz, L. P. (1).**

Ypsiscarus subgen. nov. of *Scarus* q.v.

AMMODYTIDAE

Ammodytes tantipai figd., **Jonet**; *A. dubius*, in pools on floating ice, **Holmquist**; *A. lucasanus*, location of type, **Mead (3).**

OPISTHOGNATHIDAE

Merogymnus ijonis new for Echigo Province, Japan, **Honma (1).**

Opisthognathus macrognathus from Cedar Key, Florida, **Caldwell (2).**

OWSTONIIDAE

To be included with Cepolidae, **Okada & Suzuki (1).**

PINGUPEIDAE

Neopercis atlanticus meridionalis subsp. nov. Cabo Frio, Brazil, **Carvalho, J. de P. (1) p. 202 figd.**

TRACHINIDAE

Trachinus collignoni sp. nov. Pointe-Noire, E. Africa, **Roux in Collignon, Rossignol & Roux p. 208 figd.**

LIMNICHTHYIDAE

Limnichthys nitidus sp. nov. Mozambique, **Smith, J. L. B. (11) p. 247 figd.**; *L. rendahli* sp. nov. Auckland Isl., **Parrott p. 116.**

CHIASMODONTIDAE

Pseudoscopelus stellatus, location of type, **Mead (3).**

BOVICHTHIDAE

Bovichtus variegatus juvenile characters, **Scott, E. O. G.**

NOTOTHENIIDAE

Notothenia, key to New Zealand species, **Parrott.**

CHAENICHTHYIDAE

Lacking erythrocytes and hemoglobin, **Ivanov, K. P.**

Chaenichthys rhinoceratus, *C. rugosus* compared, **Blanc.**

Chaenocephalus aceratus structure of spleen, **Walvig.**

ACANTHUROIDEA

ACANTHURIDAE

Acanthurus bahianus, *A. coeruleus* new Venezuelan record, **Martin, S. F. (1)**; *A. matoides* algal feeding, **Martin, M. & Winks**; *A. monroviae* new Moroccan record, **Furnestin & others**; *A. xanthopterus* Müllerian mimicry, **Tor-tonese (3).**

Prionurus microlepidotus new to Echigo Province, Japan, **Honma (1).**

Teuthis nigroris new Australian record, **Whitley (2).**

SIGANOIDEA

SIGANIDAE

Siganus javus Linnaeus's type re-described, **Wheeler (1)**; *S. oramin* a synonym of *S. javus*, **Wheeler (1).**

TRICHIUROIDEA

GEMPYLIDAE

Anatomy and relationships, **Matsubara & Iwai (2).**

Gempylus trumanus sp. nov. Oligocene Roumania, **Jonet p. 59 pl. vi fig. 4 pl. ix figs. 4 and 6.**

Neopinnula, *Epinnula* compared, **Matsubara & Iwai (2).**

Rexea solandri new S. Australian record, **Cowper.**

Thyrstites atun feeding migrations, **Blackburn**.

TRICHIURIDAE

Lepidopus tglarisianus figd. from Oligocene Roumania, **Jonet**.

Trichiurus haumela recorded from Turkish waters, **Akyüz**; *T. lepturus* buccal tumours, **Pinto, J. de S.**

SCOMBROIDEA

Consideration of Mediterranean forms, **Tortonese (6)**.

Key to Chilean forms; feeding habits, **Buen (5)**.

SCOMBRIDAE

Key to Spanish and Moroccan genera and species, **Lozano Cabo (3)**.

Description and distribution of larvae of four species, **Matsumoto**.

Feeding habits of tunas, **Ronquillo**.

Acanthocybium solandri biology, **Iversen & Yoshida**.

Euthynnus alletteratus new Venezuelan record, **Martin, S. F. (1)**.

Germo alalunga movements in north-west Pacific, **Inoue**; structure of thyroid, **Olivereau**; *G. germo* population study, **Kurogane & Hiyama (3)** and **(4)**.

Katsuwonus pelamis features of post larvae, **Ishiyama & Okada**.

Kishinoella zacalles new Peruvian record, **Morrow (1)**.

Lepidocybium flavobrunneum new Moroccan record, **Furnestin & others**.

Megalolepis †minutus sp. nov. Oligocene Roumania, **Jonet** p. 58 pl. viii fig. 5.

Neothunnus albacora new for Echigo Province, Japan, **Honma (1)**. *N. macropterus* comparison of Indian Ocean specimens, **Kurogane & Hiyama (2)**; biometric study, **Kurogane & Hiyama (1)**; **Nakagome (1)**; *N. macropterus*, *Katsuwonus pelamis* schooling habits, **Orange & others**.

Orcynopsis unicolor systematics and bionomics, **Postel (1)**.

Parathunnus mebachii new record for New South Wales, **Whitley (2)**; *P. sibi* new Peruvian record, **Morrow (1)**.

Pneumatophorus number and position of dorsal fin supports, **Abe & Takashima**;

P. japonicus food and growth of young, **Hatanaka & others (1)**; population study, **Takano**.

Rastrelliger canagurta scale reading, **Seshappa**; spawning area off Trivandrum, **Balakrishnan**; feeding differences in young and adult, **Narayana Rao & Pampapathi Rao**.

Sarda sarda migrations, spawning areas, **Demir**; relation between migration and temperature, **Acara (2)**; bionomics in Rumanian waters, **Ionescu & others**; movements in Turkish waters, **Nümann**.

Scomber colias bionomics, **Tuğgac**; new Venezuelan record, **Martin, S. F. (1)**; *S. scomber* migrations and distribution, **Demir & Acara**; feeding habits, **Nalbandoglu**; spawning areas in Marmara and Black Seas, **Demir & Arim**; movements in Turkish waters, **Nümann**; population study, **Nedelec**; *S. †voitestii* figd., **Jonet**.

Thunnus obesus distribution, **Mather & Gibbs**; *T. orientalis* figd. cave deposits Japan, **Shikama & Okafuji**; *T. thynnus* biometric study, **Doumenge & Lahaye**; **Genovese**; bionomics, **Akyüz & Artüz**; migrations, **Smith, F. G. W.**; pineal organ, **Holmgren**; structure of thyroid, **Olivereau**; amino acid composition of haemoglobin, **Marco & Antonini**.

ISTIOPHORIDAE

Key to African genera, **Smith, J. L. B. (1)**; taxonomy, key to and bionomics of Central Pacific forms, **Royce**; relative visceral weights of Atlantic species, **Krumholz**; use of spear in feeding, **Wisner**.

Istiompax indica glauca subsp. nov. N.S.W., **Smith, J. L. B. (1)** p. 30 figd.

Istiophorus americanus juvenile from Texas waters, **Springer & Hoese**.

Kajikia Hirasaka and Nakamura a synonym of *Marlina* Grey, **Smith, J. L. B. (1)**.

Lamontella gen. nov. type *Tetrapterus albidus* Poey, **Smith, J. L. B. (1)** p. 32.

Makaira structure of pectoral girdle, **Morrow (4)**; food, **Krumholz & DeSylva**; *M. albidus* distribution in Gulf of Mexico, **Gibbs, R. H. (1)**; *M. ampla* juvenile, **DeSylva**; *M. ampla mazara* new Peruvian record, **Morrow (1)**; *M. ampla*, *M. albidus*, structure of alimentary, excretory and reproductive organs,

La Monte (2); *M. mitsukurii* racial study, **Morrow** (3); *M. nigricans glauca* subsp. nov. N.S.W., **Smith, J. L. B.** (1) p. 30 figd.

Marlina jauffreti sp. nov. Mauritius, **Smith, J. L. B.** (1) p. 31 figd.

Orthocraeros gen. nov. type *Makaira bermudae* Mowbray, **Smith, J. L. B.** (1) p. 31 figd.

Tetrapturus angustirostris new record for Californian waters, **Craig**; *T. belone* measurements of female from Texas waters, **Springer & Hoese**.

XIPHIIDAE

Xiphias gladius distribution and migration in northwest Pacific, **Nakagome** (3); spawning area in Marmara Sea, **Demir & others**.

GOBIOIDEA

ELEOTRIDAE

Key to genera and species of Western Indian Ocean, **Smith, J. L. B.** (3).

Ambyeleotris (*Fereleotris*) *delicatulus* subgen. et sp. nov. Zanzibar, **Smith, J. L. B.** (3) p. 152 figd.; *A. japonicus* sp. nov. Kagoshima Bay, Japan, **Takagi** p. 105 figd.

Asterropteryx semipunctatus from Kochi Prefecture, Japan, **Kamohara** (1).

Austrolethops wardi new western Indian Ocean record, **Smith, J. L. B.** (9).

Butis caperatus **Smith** a synonym of *Prionobutis koilomatodon* (**Bleeker**), **Smith, J. L. B.** (3).

Calumia biocellata gen. et sp. nov. Zanzibar, **Smith, J. L. B.** (3) p. 148 figd.

Chrolepidops nebulofasciatus gen. et sp. nov. Mozambique, **Smith, J. L. B.** (3) p. 158 figd.

Coryogalops anomolus gen. et sp. nov. Zanzibar, **Smith, J. L. B.** (3) p. 144 figd.

Cryptocentrops gen. nov. p. 152 type *C. exilis* sp. nov. Zanzibar p. 153 figd., **Smith, J. L. B.** (3).

Culius robustus redescribed, **Whitley** (2).

Dactyleotris tentaculatus gen. et sp. nov., Bazaruto, **Smith, J. L. B.** (3) p. 161 figd.

Eleotriodes sexguttatus recorded from Seychelles, **Smith, J. L. B.** (3).

Eleotris melanosoma recorded from western Indian Ocean, **Smith, J. L. B.** (3).

Eviota verna Aldabra p. 140 figd., *E. stigmatopon* Seychelles p. 141 figd., *E. nebulosa* Mozambique p. 141 figd., spp. nov., **Smith, J. L. B.** (3); *E. woolacottae* sp. nov. New Hebrides, **Whitley** (3) p. 85 figd.

Fereleotris subgen. nov. of *Ambyeleotris* q.v.

Heteroleotris kenya sp. nov. Kenya, **Smith, J. L. B.** (3) p. 159 figd.

Leioeleotris **Fowler** a synonym of *Heteroleotris* **Bleeker**, **Smith, J. L. B.** (3).

Leptophilypnus crocodilus, location of type, **Mead** (3).

Liotes (*Liotes*) *caminatus* gen. et sp. nov. Shimoni, **Smith, J. L. B.** (3) p. 156 figd.; *L. (Pseudoliotes) simularis* subgen. et sp. nov. Gulf of Suez, **Smith, J. L. B.** (3) p. 157 figd.

Mogurnda bloodi sp. nov. New Guinea, **Whitley** (4) p. 28.

Mucogobius flavobrunneus p. 145 figd., Mozambique, *M. bifasciatus* p. 146 figd. Pemba, spp. nov., **Smith, J. L. B.** (3); *M. liolepis* recorded from western Indian Ocean, **Smith, J. L. B.** (3).

Parioglossus dotui sp. nov. Japan, **Tomiyama** in **Tomiyama & Abe** p. 1179 figd.

Pseudoliotes subgen. nov. of *Liotes* q.v.

Salarigobius stuhlmanni **Pfeffer** juvenile form of *Eleotriodes sexguttatus* (**Val.**), **Smith, J. L. B.** (3).

Satulinus zanzibarensis gen. et sp. nov. Zanzibar, **Smith, J. L. B.** (3) p. 160 figd.

Xenisthmus africanus sp. nov. Mozambique, **Smith, J. L. B.** (3) p. 153 figd.

GOBIIDAE

Value of sensory line system as a taxonomic character, **Takagi**.

Chromosome studies, **Nogusa** (2).

Astrabe laticella new to Echigo Province, Japan, **Honma** (1).

Bathygobius soporator photos of spawning behaviour, **Tavolga** (2); significance of sounds produced by males, **Tavolga** (3).

Brachygobius key to species, Inger; *B. kabiliensis* p. 110 figd., *B. sabanus* p. 113 figd., spp. nov. N. Borneo, Inger.

Callogobius shunkan sp. nov. Kago-shima Pref., Japan, Takagi p. 112 figd.

Chaenogobius scrobiculatus sp. nov. Fukuoka Pref., Japan, Takagi p. 120 figd.

Clariger cosmurus from Kochi Prefecture, Japan, Kamohara (1).

Clevelandia ios racial study, Prasad.

Cryptocentrus symbiotic association with the crayfish *Alpheus*, Luther; *C. pretoriusi* sp. nov. Pondoland, S. Africa, Smith, J. L. B. (12) p. 127 figd.

Ctenogobius dotui sp. nov. Rokkaku river, Japan, Takagi p. 109 figd.; bionomics, Dôtu (3); *C. transparentus* sp. nov. Lesser Antilles, Caribbean, Klausewitz (5) p. 78 figd.

Garmannia zebrella sp. nov. Trinidad, Robins (2) p. 192 figd.

Glossogobius giuris feeding habits, Moitra (2).

Gnatholepis inconsequens sp. nov. Queensland, Whitley (2) p. 44.

Gobiodon citrinus, habitat, Klausewitz (4).

Gobionellus stigmalophius sp. nov. Bahamas, Mead & Böhlke p. 286 figd.

Gobiosoma chancei; *G. macrodon*, location of types, Mead (3).

Gobius forsteri sp. nov. Devon, Corbin p. 1659; *G. †imperfectus* p. 29 pl. ii figs. 3, 6; *G. †rotundus* p. 29 pl. ii figs. 4; *G. †captiosus* p. 31 pl. ii figs. 5 spp. nov. otoliths Miocene Azerbaijan, Pobedina; *G. minutus* geographic variation, Swedmark; *G. †multipinnatus* with otoliths figd., Weiler (2); *G. ophiocephalus* abnormal specimens from Taranto Gulf, Italy, Parenzan (2).

Ot. (*Gobius*) *†pricaspicus* sp. nov. p. 159 pl. xxiii fig. 4; Ot. (*G.*) *†captiosus*, *†pretiosus*, *†rotundus*, *†rotundus* var. *tarchanensis* figd. Miocene Azerbaijan, Pobedina & others.

Lesueurigobius nom. nov. for *Lesueria* Duncker 1928 pre-occ., Whitley (1) p. 44.

Luciogobius saikaiensis bionomics, Dôtu & Mito.

Microgobius miraforensis taxonomic and ecological notes, Miller, R. R.

Munrogonobius Whitley 1951 redundant, Trewavas (1).

Obtortiphagus koumansii living in association with a prawn, Smith, J. L. B. (19).

Oxyurichthys formosanus sp. nov. Tam-sui river, Formosa, Nichols p. 4 figd.

Paleatogobius gen. nov. p. 117 type *P. uchidai* sp. nov. p. 118 figd., Kanakuzu river, Japan, Takagi; bionomics, Dôtu (1).

?*Periophthalmus*, Pleistocene of Europe, Brunner; *P. barbarus*, digging in aquarium after fall in water-level, Lüling (2); *P. cantonensis* early development, Kimura; *P. koelreuteri*, status of W. African population, Tortonese & Arbocco.

Proterorhinus marmoratus, distribution, Bauer, K.

Sicyopterus extraneus bionomics, Manacop.

Stigmatogobius minutus sp. nov. Kago-shima Pref., Japan, Takagi p. 114 figd.

Suruga fundicola from Suruga Bay, Kuroda (2).

Tridentiger undicervicus, *T. trigonocephalus* bionomics, Dôtu (2).

KRAEMERIIDAE

Relationships; key to genera and species, Rofen.

Kraemia cunicularia Palau Isl. p. 187 figd., *K. tongaensis* Tonga Isl. p. 190 figd., *K. galatheaensis* Rennell Isl., p. 191 figd., spp. nov., Rofen.

GOBIOIDIDAE

Gobioides senegalensis sp. nov. Senegal, Puyo p. 185 figd.

TAENIOIDIDAE

Taenioides gertrudae Fowler now referred to *Gunnellichthys pleurotaenia* (Gunnellichthidae), Smith, J. L. B. (2).

BLENNIOIDEA

Morphology and systematics, Maku-shok.

Keys to Chinese families, genera and species, Fowler (2).

BLENNIDAE

Blennius cristatus Linnaeus's type redescribed, Wheeler (1); *B. fluviatilis* behaviour, Wickler (3); *B. knipowitschi* Slastenenko a synonym of *B. trigloides*, Svetovidov (3); *B. multifilis*

Girard 1858 a synonym of *B. geminatus* Wood 1824, Pinto, S. Y. (2); *B. ponticus* Slastenko synonymous with *B. zvonimiri*, Svetovidov (3).

Calliblennius rubescens Aoyagi a synonym of *Ernogrammoides fasciatus* (Acanthoclinidae), Katayama (1).

Clarkichthys subgen. nov. of *Gunnellichthys* q.v.

Enchelyurus kraussi figd., Smith, J. L. B. (9).

Entomacrodus wolffi sp. nov. Rennell Isl., Rofen p. 202 figd.

Graviceps darwini sp. nov. Port Darwin, N.T., Whitley (2) p. 47.

Gunnellichthys keys to subgenera and species, Smith, J. L. B. (2); *G. (Clarkichthys)* subgen. nov. type *Cerdale bilineata* Clark, Smith, J. L. B. (2) p. 128; *G. (G.) monostigma* p. 127 figd., *G. (G.) irideus* p. 128 figd. spp. nov. Mozambique, Smith, J. L. B. (2).

Homesthes carlopus new Peruvian record, Morrow (1).

Hypleurochilus bermudensis, location of type, Mead (3); *H. geminatus* morphology, Pinto, S. Y. (2).

Hypoblennius piersoni new Peruvian record, Morrow (1).

Istiblennius bilineatus from Kochi Prefecture, Japan, Kamohara (1); *I. rennellensis* sp. nov. Rennell Isl., Rofen p. 199 figd.

Lembeichthys furocaudalis sp. nov. S. China Sea, Sze-chung p. 229 figd.

Lucayaoblennius nom. nov. for *Lucaya* Böhlke pre-occ., Böhlke (1).

Ophioblennius ferox, location of type, Mead (3).

Parablennius Ribeiro, validity, Pinto, S. Y. (1).

Runula albolinea, location of type, Mead (3).

Rupiscartes atlanticus new Peruvian record, Morrow (1).

Soldatovia gen. nov. type *Blennius polyactocephala* Pallas, Taranetz in Makushok p. 118.

Somersia furcata, location of type, Mead (3).

Xiphasia setifer recorded off Ceylon, Silva (2).

ANARHICHADIDAE

Anarhichas lupus first Mediterranean record, Tortonese (9).

CLINIDAE

Systematics and zoogeography of the Labrisomini, Springer, V. G.

Acanthemblemaria arborescens; *A. crockeri*; *A. variegata*, location of types, Mead (3).

Chaenopsis dellarrhis, location of type, Mead (3).

Cremnobates argus, location of type, Mead (3).

Emblemaria micropes, location of type, Mead (3).

Ernogrammoides fasciatus new to Japan, Katayama (1).

Labrisomus key to species, Springer, V. G.; *L. albigenys*; *L. haitiensis*, location of types, Mead (3).

Malacoctenus key to species, Springer, V. G.; *M. bimaculatus* new Venezuelan record, Martin, S. F. (1); *M. boehlkei* Bahamas p. 444 figd., *M. gigas* Gulf of California p. 457 figd., *M. hubbsi* Gulf of California p. 463 figd., *M. costaricanus* Costa Rica p. 468 figd., *M. zacae* Mexico p. 470 figd., *M. triangulatus* Bahamas p. 477 figd., *M. ebisui* Panama p. 478 figd. spp. nov., Springer, V. G.; *M. margaritae mexicana* Baja California p. 449 figd.; *M. afuerae multipunctatus* Baja California p. 462 figd.; *M. h. hubbsi* Gulf of California p. 465 figd.; *M. h. polyporosus* Mexico p. 468 figd.; *M. zoni fer sudensis* Panama p. 474 figd.; subspp. nov., Springer, V. G.

Mnierpes macrocephalus catherinae location of type, Mead (3).

Ophioclinus gracilis new Tasmanian record, Olsen.

Paraclinus beebei location of type, Mead (3).

Parviclinus spinosus Fraser-Brunner a synonym of *Stathmonotus (Auchenistius) stahli* (Evermann & Marsh), Wheeler (3).

Starksia hassi sp. nov. Lesser Antilles, Caribbean, Klauswitz (5) p. 76 figd.

Stathmonotus corallicola; *S. lugubris* location of types, Mead (3).

DACTYLOSCOPIDAE

Gillellus quadrocinctus location of type, Mead (3).

STICHAETIDAE

Alectriinae subfam. nov., **Makushok**.

Azygopterinae subfam. nov., **Makushok**.

Acantholumpenus gen. nov. type *Lumpenus mackayi* Gilbert, **Makushok** p. 87.

Cryptacanthoides bergi new to Echigo Province, Japan, **Honma** (1).

Stichaeus nozawai new to Echigo Province, Japan, **Honma** (1).

PHOLIDIDAE

Centronotus gunnellus food, growth and reproduction, **Qasim** (2).

MICRODESMIDAE

Status and distribution, **Robins & Manning**.

Microdesmus longipinnis recorded from Florida, **Robins & Manning**; *M. woodsi* Kanazawa a synonym of *M. longipinnis*, **Robins & Manning**.

ZOARCIDAE

Lycenchelys albeolus p. 175 figd., *L. uschakovi* p. 176 figd., *L. birsteini* p. 178 figd., spp. nov. Kurile-Kamchatka Trench, **Andriyashev** (3).

Lycodes agnostus Jensen a synonym of *L. polaris* Sabine, **Andriyashev** (1); *L. macrolepis* new to Echigo Province, Japan, **Honma** (1).

OPHIDIIOIDEA

BROTULIDAE

Cherublemma telepris location of type, **Mead** (3).

Dicrolene gregoryi location of type, **Mead** (3); *D. kanazawai* sp. nov. Gulf of Mexico, **Grey** (2) p. 170 figd.

Lamprogrammus exutus sp. nov. S. Atlantic, **Nybelin & Poll** p. 2 figd.

Parabrotula denti location of type, **Mead** (3).

Penopus microphthalmus recorded from Gulf of Mexico, **Grey** (2).

Porogadus miles, *P. subarmatus* recorded from Gulf of Mexico, **Grey** (2).

OPHIDIIDAE

Lepophidium jeannae redescribed, **Robins** (1); *L. staurophor* sp. nov. Caribbean, **Robins** (1) p. 361 figd.

Ophidion tigranosum sp. nov. Otolith Mioene Victoria, **Stinton** p. 90 pl. xiii fig. 14.

CARAPIDAE

Carapus acus behaviour towards Holothurian host, **Arnold**.

Encheliophis (Jordanicus) *gracilis* recorded from Maldives Isl., **Palmer**.

Jordanicus texiguus otoliths figd. Miocene Victoria, **Stinton**.

STROMATEOIDEA

STROMATEIDAE

Notes on Angolan examples, **Franca**.

Poronotus triacanthus from Cedar Key, Florida, **Caldwell** (2).

Stromateus fasciatus new Moroccan record, **Furneston & others**.

NOMEIDAE

Cubiceps gracilis from Kochi Prefecture, Japan, **Kamohara** (1); *C. niger* sp. nov. Luanda, **Nümann** in **Franca** p. 10 figd.; *C. squamiceps* gill raker counts, **Smith, J. L. B.** (14).

Palinurichthys pringlei sp. nov. Dassen Isl., S. Africa, **Smith, J. L. B.** Sea fishes of Southern Africa 1949 : 304 figd. [Omitted from volume 86].

Psenes cyanophrys from Kochi Prefecture, Japan, **Kamohara** (1); *P. rotundus* sp. nov. Dassen Isl., S. Africa, **Smith, J. L. B.** Sea Fishes of Southern Africa 1949 : 307 figd. [Omitted from volume 86].

Serirolella noel sp. nov. New South Wales, **Whitley** (2) p. 32.

ANABANTOIDEA

ANABANTIDAE

Ecological requirements of Malayan species, **Johnson**.

Onset of airbreathing in young, **Stolzenhain**.

Hydrostatic apparatus of larvae, **Gilch**.

Anabas testudineus structure of swim bladder, **George**.

Betta pugnax feeding habits in Malaya, **Alfred**; *B. splendens* genetics, **Wallbrunn**; effect of amphenone "B," **Overbeeke**; effects on behaviour of tranquilizing drugs, **Walaszek & Abood**; *B. taeniata*, spawning and parental care, **Kuenzer** (2).

Ctenopoma fasciolatum breeding in aquarium, nest, eggs, young, *C. acutirostris*, *ocellatum*, *ansorgei*, *nanum*, photos, *Nieuwenhuizen* (3); *C. kingsleyae*, Haute-Volta, *C. petherici*, Upper Niger, **Daget** (6); *C. petherici*, *kingsleyi*, structure, relationships, population characters, distribution, *C. muriei* definition and distribution, **Daget** (2).

Macropodus opercularis validity and original description, **Rendahl**.

Sphaerichthys osphromenoides, spawning in aquarium, **Ladiges** (1).

Trichogaster trichopterus, spawning in aquarium, **Härtel** (2).

Trichopodus trichopterus development of chondrocranium, **Marathe & Bal** (1); development of caudal skeleton, **Marathe & Bal** (2).

OPHICEPHALOIDEA

OPHICEPHALIDAE

Structure of caudal fin, **Hussein**.

Ophicephalus punctatus morphology of skull, **Swarup** (2); spermatogenesis, **Vasisht**; oogenesis, **Nath**; histochemical study of oocytes, **Chopra**; *O. striatus* circulatory system, **Marathe & Kulkarni**.

MUGILOIDEA

MUGILIDAE

Swim bladder, **Srivastava** (1).

Agonostomus monticola description of larval forms from open ocean, **Anderson** (2).

Aldrichetta forsteri bionomics, **Thomson** (1); scale interpretation, **Thomson** (2).

Chaenomugil proboscideus new Peruvian record, **Morrow** (1).

Mugil key for identification of juveniles, **Perlmutter & others**; food and growth of species in Turkish waters, **Denizci**; *M. cephalus* early development, **Nair** (2); development, growth and spawning, **Anderson** (3); spawning areas in Gulf of Mexico, **Arnold & Thompson**; seaward breeding migration, **Jhingran**; *M. curema* development, growth and spawning, **Anderson** (1).

ATHERINIDAE

Adenops dissimilis sp. nov. Brazil, **Carvalho J. de P.** (2) p. 93 figd.

Anisocentrus campsi sp. nov. New Guinea, **Whitley** (4) p. 26 figd.

Atherina caspia new Moroccan record, **Furnestin & others**.

Atherion key to species, **Rofen**; *A. elymus* new for Echigo Province, Japan, **Honma** (1).

Bedotia geayi in aquarium, **Meinken** (4).

Centratherina tenuis Nichols a synonym of *Anisocentrus campsi* **Whitley**, **Whitley** (2).

Melanotaenia key to N.S.W. species, **Whitley** (6).

POLYNEMOIDEA

POLYNEMIDAE

Axial skeleton, **Marathe & Bal** (3).

Eleutheronema tetradactylum development of caudal skeleton, **Marathe & Bal** (2).

Polydactylus †fossilis sp. nov. Tertiary Caucasus, **Danil'chenko** p. 96 text. fig. 1.

SCLEROPAREI

SCORPAENOIDEA

SCORPAENIDAE

Phylogenetic significance of cycloid scales, **Kobayashi, H.** (4).

Key to genera, **Smith, J. L. B.** (4).

Species of Moroccan waters, taxonomy, growth, reproduction, distribution, teratology, **Boutière**.

Keys to genera and species of California, **Phillips, J. B.** (1).

Amblyapistus (*Parocosia*) *slacksmithi* subgen. et sp. nov. Queensland, **Whitley** (2) p. 45.

Apistus carinatus new to Echigo Province, Japan, **Honma** (1).

Dendrochirus brachyptera recorded from Maldive Isl., **Palmer**; recorded from Aldabra, **Smith, J. L. B.** (5).

Dendroscorpaena cirrhosa recorded from Aldabra, **Smith, J. L. B.** (5).

Helicolenus, status of genus, **Boutière**.

Hypomacrus africanus Zanzibar, *H. minor* Bazaruto, spp. nov., **Smith, J. L. B.** (4) p. 178; *H. albaiensis* from western Indian Ocean, **Smith, J. L. B.** (5).

Kantapus Smith 1947 a synonym of *Sebastapistes*, **Smith, J. L. B. (5).**

Paracentropogon profundus sp. nov. Mozambique, **Smith, J. L. B. (4)** p. 171 figd.

Parascorpaena aurita, *P. maculipinnis* recorded from Aldabra, **Smith, J. L. B. (5).**

Parocosia subgen. nov. of *Amblyapistus* q.v.

Paronescodes asperrimis gen. et sp. nov. Seychelles, **Smith, J. L. B. (4)** p. 177.

Phenascorpius nebulosus sp. nov. Bazaruto, S. Africa, **Smith, J. L. B. (4)** p. 177 figd.

Pterois radiata colour-photo, **Unger in Klausewitz (3)**, description, colour-change, **Klausewitz (3)**; *P. volitans* effect of wound from spines, **Ray & Coates**; *P. volitans*, *P. russelli*, *P. antennata*, *P. radiata* recorded from Aldabra, **Smith, J. L. B. (5).**

Richardsonichthys gen. nov. type *Apistus leucogaster* Richardson, **Smith, J. L. B. (4)** p. 169.

Scorpaena surface area of gill lamellae, **Feider & others**; Black Sea species, **Svetovidov (1)**; *S. †boulei* figd. from Oligocene Roumania, **Jonet**; *S. †ensiger* figd. from Miocene Poland, **Jerzemska (1)** *S. gaillardae* description, **Roux in Collignon, Rossignol & Roux**; *S. mossambica* Peters, *S. longicornis* Playfair, *S. zanzibarensis* Playfair = *Parascorpaena aurita* (Rüppell), **Smith, J. L. B. (5)** *S. voltzkowi* Jatzow & Lenz 1898 possibly synonymous with *Sebastapistes oglinus* (Smith), **Smith, J. L. B. (5).**

Scorpaenodes key to western Indian Ocean species, **Smith, J. L. B. (5)**; *S. caribbaeus* new Venezuelan record, **Martin, S. F. (1)**; *S. cortezi*; *S. russelli*, location of types, **Mead (3)**; *S. guamensis*, *S. parvipinnis*, *S. hirsutus*, *S. corallinus*, *S. varipinnis* from western Indian Ocean, **Smith, J. L. B. (5).**

Scorpaenopsis gibbosa recorded from Aldabra, **Smith, J. L. B. (5).**

Sebastapistes nuchalis, *S. oglinus*, *S. kowiensis* recorded from western Indian Ocean, **Smith, J. L. B. (5).**

Sebastes marinus bionomics, **Steele**; growth rate, **Sandeman**; interpretation of otolith zones, **Bratberg**; description of

everted internal organs, **Wunder (4)**; *S. marinus marinus*, *S. m. mentella* form of retina, **Wunder (3)**; *S. oblongus* development of eggs and larvae, **Fujita (3)**; *S. pachycephalus* from Kochi Prefecture, Japan, **Kamohara (1)**; *S. pachycephalus nigricans* larval development, **Fujita (2).**

Sebastichthys capensis Gmelin's type redescribed, **Wheeler (1).**

TRIGLIDAE

Aoyagichthys subgen. nov. of *Paratrigla* q.v.

Chelidonichthys senegalensis sp. nov. Senegal, **Puyo** p. 182 figd.

Lepidotrigla grandis Ogilby a synonym of *L. spiloptera* Günther, **Whitley (2).**

Marubecula nom. nov. type *Prionotus horrens* Richardson for *Dinichthys* Kaup 1872 pre-occ., **Whitley (1)** p. 44.

Paraheminodus kochiensis sp. nov. Kochi Prefecture, Japan, **Kamohara (1)** p. 78 figd.

Paratrigla (*Aoyagichthys*) subgen. nov. type *Trigla vanessa* Richardson, **Whitley (2)** p. 46.

Prionotus calling influenced by sound, **Moulton (1)**; *P. evolans*, *P. carolinus* types of sound production, **Moulton (3)**; *P. teaguei*, location of type, **Mead (3).**

Trigla lineata biometric study, **Monteiro (1)**; *T. †miocenica* p. 28 pl. i figs. 5, 6; *T. †konkensis* p. 29 pl. i figs. 1, 2, spp. nov. otoliths Miocene Azerbaijan, **Pobedina.**

Ot. (*Trigla*) *†konkensis*, *†miocenicus*, cf. *†asperoides* figd. Miocene Azerbaijan, **Pobedina et al.**

CARACANTHIDAE

Caracanthus unipinna, *C. maculatus* recorded from Aldabra, **Smith, J. L. B. (5).**

SYNANCEJIDAE

Key to genera, **Smith, J. L. B. (4).**

Synanceja verrucosa widespread in western Indian Ocean, **Smith, J. L. B. (5).**

HEXAGRAMMIDAE

Pleurogrammus azonus growth rate, **Kyushin**; *P. monopterygius* description of larvae and young, **Kobayashi, K. (2).**

ANOPILOPOMATIDAE

Anoplopoma fimbria bionomics and fishery, **Phillips & others**; fishery, **Phillips, J. B. (2)**; development of larvae and young, **Kobayashi, K. (1).**

PLATYCEPHALIDAE

Platycephalus indicus, *P. grandidieri* recorded from Aldabra, **Smith, J. L. B.** (5); *P. †petilus* sp. nov. Otolith Miocene Victoria, **Stinton** p. 90 pl. xiii fig. 1.

Thysanophrys portuguesus recorded from Aldabra, **Smith, J. L. B.** (5).

CONGIOPODIDAE

Congiopodus torvus Gronovius's type redescribed, **Wheeler** (1).

COTTIDAE

Of Lake Baical revised, **Taliev**; development and role of protective devices, **Paraketsov**.

Abyssocottus pallidus, *A. elochini* sp. nov. *A. godlewskii griseus* subsp. nov. Lake Baical, **Taliev** p. 347.

Artediellus auriculatus, *A. dydymovi* new to Echigo Province, Japan, **Honma** (1).

Asprocottus herzensteini intermedius, *A. h. abyssalis*, *A. h. platycephalus*, *A. h. parmitiferus* subsp. nov. Lake Baical, **Taliev**, p. 319; *A. megalops euryostomus* subsp. nov. Lake Baical, **Taliev** p. 332; *A. pulcher* sp. nov. Lake Baical, **Taliev** p. 316.

Batrachocottus uschkani sp. nov.; *B. baicalensis pachytus* subsp. nov. Lake Baical, **Taliev** p. 256.

Clinocottus analis homing behaviour, **Williams, G. C.**

Cottus gobio, *C. gobio koshewnikowi* in Finnish and Swedish waters, **Koli**; *C. poecilopus*, *C. gobio* differences in lateral line pores, **Nybelin** (3); *C. pollux* sex determining chromosomes, **Nogusa** (1).

Icelus uncinialis stenosomus new to Echigo Province, Japan, **Honma** (1).

Leocottus subgen. nov. of *Paracottus* q.v.

Paracottus (*Leocottus*) *pelagicus* subgen. et sp. nov. Lake Baical, **Taliev** p. 235; *P. (P.) insularis* sp. nov. Lake Baical, **Taliev** p. 235; *P. (L.) kessleri lubricus* subsp. nov. Lake Baical, **Taliev** p. 235.

Psychrolutes paradoxus new to Echigo Province, Japan, **Honma** (1).

Rhamphocottus richardsoni occurrence off Southern California, **Phillips, J. B.** (3).

Ricuzenius toyamensis new to Echigo Province, Japan, **Honma** (1).

COMEPHORIDAE

Of Lake Baical, revised, **Taliev**.

AGONIDAE

Bothragonus swani second specimen from California, **Houck**.

Ganoideus nom. nov. for *Stelgis* Jordan & Starks 1896 pre-occ., **Whitley** (1) p. 44.

Pallasina barbata aix new Californian record, **Hemphill & Follett**.

CYCLOPTERIDAE

Cyclopterus lumpus occurrence of larvae in Liverpool Bay, **Ellison**.

LIPARIDAE

Liparis liparis Linnaeus's type redescribed, **Wheeler** (1); *L. punctulatus franzi* new to Echigo Province, Japan, **Honma** (1).

DACTYLOPTEROIDEA

CEPHALACANTHIDAE

Dactyloptena orientalis recorded from Aldabra, **Smith, J. L. B.** (5).

THORACOSTEI

GASTEROSTEIDAE

Culaea nom. nov. for *Eucalia* Jordan 1876 pre-occ., **Whitley** (1) p. 44.

Eucalia inconstans variation in dorsal spine number, **Lawler**.

Gasterosteus aculeatus development, **Swarup** (4); production of heteroploidy, **Swarup** (1); breeding and migration studies, **Baggerman**; changes in kidney following hormone injection, **Oguro** (1) & (2); *G. aculeatus*, *Pygosteus pungitius* spines as means of defence, **Hoogland & others**.

Pungitius sinensis variation of scute number, **Igarasi**.

HETEROSOMATA

Meristic comparison of examples of four families, **Monteiro** (2) & (3).

PSETTODIDAE

Psettodes erumei vertebral column, **Kirtisinghe**.

BOTHIDAE

Chascanopsetta lugubris Western Atlantic records, **Deubler & Rathjen**.

Citharichthys gordae, location of type, Mead (3).

Dollfusetta **nom. nov.** for *Dollfusina* Chabanaud 1933 pre-occ., Whitley (1) p. 44.

Imhoffichthys Whitley 1951 redundant, Trewavas (1).

Monolene maculipinna new Peruvian record, Morrow (2).

Paralichthys californicus albinism and ambicoloration, McKeever; *P. dentatus* a reversed ambicolorate example, Deubler & Fahy; *P. dentatus*, *P. lethostigma*, *P. albigutta* comparative study of post-larvae, Deubler.

Phrynorhombus †*medius* **sp. nov.** otolith Miocene Lower Rhine, Weiler (1) p. 349 pl. iii fig. 16; *P. regius* new Moroccan record, Furnestin & others.

Rhombus †*taltus* **sp. nov.** p. 28 pl. i fig. 4; *R. corius* †*miocenicus* **var. nov.** p. 26 pl. i fig. 1; *R. c.* †*foliformis* **var. nov.** p. 28 pl. i fig. 3; otoliths Miocene Azerbaijan, Pobedina; *R.* †*stamatini* figd., Jonet.

Ot. (*Rhombus*) †*taltus*, †*corius* vars. *miocenicus*, *foliformis* figd. Miocene Azerbaijan, Pobedina et al.

PLEURONECTIDAE

Curioptera Whitley 1951 redundant, Trewavas (1).

Eopsetta jordani movements of spawning population, Alverson & Chatwin.

Glyptocephalus cynoglossus Linnaeus's type redescribed, Wheeler (1).

Hippoglossus hippoglossus bionomics and fishery, McCracken (2); parasitised by plerocercoid larvae, Rae; *H. stenolepis* southerly occurrence off Californian coast, Phillips, J. B. (3).

Limanda aspera, *L. p. punctatissima* spawning habits and fecundity, Fadeyev; *L. limanda* bionomics, Bohl.

Liopsetta obscura formation of egg, Yamamoto, K. (1).

Platichthys flesus italicus ambicolorate example, Ghirardelli; *P. stellatus* × *Parophrys vetulus* gonadal study of hybrids, Aron.

Pleuronectes platessa fecundity, Bagenal; *P. platessa*, *P. flesus* size of visceral cavity in sinistral forms, Koltzer; *P.* †*bulsus* **sp. nov.** Otolith Miocene Victoria, Stinton p. 91 pl. xiii fig. 10.

Pseudopleuronectes herzensteini spawning habits and fecundity, Fadeyev.

Pseudorhombus arsius from Suruga Bay, Kuroda (2).

SOLEIDAE

Gymnachirus williamsoni from Cedar Key, Florida, Caldwell (2).

Liachirus whitleyi correction of type locality, Whitley (2).

Pardachirus pavoninus, glands at bases of fin-rays, Ochiai (2).

Solea †*simplex* **sp. nov.** Otolith Miocene Azerbaijan, Pobedina p. 34 pl. iv fig. 6; *S. solea* unusual pigmentation of an injured specimen, Chabanaud (2).

Trichobranchius selheimi redescribed, Whitley (2).

Trinectes maculatus fasciatus lack of coloration on eyed side, Hoese & Berglund.

CYNOGLOSSIDAE

Cynoglossus lingua development and feeding habits, Kuthalingam.

Symphurus fallax **sp. nov.** Kei Isl., Dutch E. Indies, Chabanaud (1) p. 183.

DISCOCEPHALI

ECHENEIDAE

Key to Taiwan genera, Chu.

Echeneis turupensis **sp. nov.** Tertiary Caucasus, Danil'chenko p. 95 pl. ii fig. 1.

Remilegia australis new record from S. Africa, Smith, J. L. B. (14).

Rhombochirus osteochir from Texas waters, Springer & Hoese.

PLECTOGNATHI

†TRIGONODONTIDAE

Trigonodon oweni teeth figd. Neogene France, Leriche; Bauza Rullan (2).

BALISTOIDEA

TRIACANTHODIDAE

Tydemania navigatoris new S. African record, Smith, J. L. B. (14).

BALISTIDAE

Balistapus undulatus recorded from Aldabra, Smith, J. L. B. (5).

Balistes papuensis Macleay a synonym of *Pseudobalistes flavimarginatus*, Whitley (2); *B. vidua kamoharai* **nom. nov.** for *B. nycterias* Kamohara (not of Jordan & Evermann), Abe p. 178.

Balistoides conspicillum recorded from Aldabra, **Smith, J. L. B. (5)**.

Hemibalistes chrysoptera, *H. bursa* recorded from Aldabra, **Smith, J. L. B. (5)**.

Melichthys vidua, *M. ringens* recorded from Aldabra, **Smith, J. L. B. (5)**.

Odonus niger recorded from Aldabra, **Smith, J. L. B. (5)**.

Pseudobalistes fuscus, *P. flavimarginatus* recorded from Aldabra, **Smith, J. L. B. (5)**.

Rhinecanthus aculeatus, *R. rectangulus* recorded from Aldabra, **Smith, J. L. B. (5)**.

Sufflamen albicaudatus Mullerian mimicry, **Tortonese (3)**.

MONACANTHIDAE

Correlation between presence of ventral spine and inflatable stomach, **Arbocco**.

Notes on species from Ceylon, **Silva (3)**.

Amanes scopas, *A. sandwichiensis* from western Indian Ocean, **Smith, J. L. B. (5)**.

Hanomanctus bovinus recorded from Aldabra, **Smith, J. L. B. (5)**.

Laputa cingalensis new record from S. Africa, **Smith, J. L. B. (14)**.

Oxymonacanthus longirostris recorded from Aldabra, **Smith, J. L. B. (5)**.

Paraluteres prionurus recorded from Indian Ocean, **Smith, J. L. B. (9)**.

Paramonacanthus oblongus recorded from Ceylon waters, **Silva (3)**.

Pervagor melanocephalus recorded from Aldabra, **Smith, J. L. B. (5)**.

Stephanolepis cirrifer colour change related to dominance, **Okaichi & others**.

OSTRACIANTIDAE

Lactoria cornutus, *L. diaphana*, *L. fornasini* recorded from Aldabra, **Smith, J. L. B. (9)**.

Ostracion tuberculatus, *O. lentiginosus* recorded from Aldabra, **Smith, J. L. B. (9)**.

TETRAODONTOIDEA

TETRAODONTIDAE

Arothron key to African species, **Smith, J. L. B. (10)**; *A. hispidus*, *A. stellatus*, *A. nigropunctatus* recorded

from Aldabra, **Smith, J. L. B. (9)**; *A. inconditus* sp. nov. Algoa Bay, **Smith, J. L. B. (10)** p. 159 figd.; *A. meleagris*, *A. citrinellus* new western Indian Ocean records, **Smith, J. L. B. (9)**.

Canthigaster valentini, *C. bennetti*, *C. margaritatus*, *C. janthinopterus* recorded from Aldabra, **Smith, J. L. B. (9)**.

Carinotetraodon chlupatyi, fig., behaviour, **Benl & Chlupaty**.

Chelonodontops pulchellus gen. et sp. nov. Xora mouth, Transkei, **Smith, J. L. B. (10)** p. 156 figd.

Lagocephalus laevigatus recorded from Cedar Key, Florida, **Berry (2)**.

Sphoeroides key to Peruvian species, **Morrow (1)**; *S. andersonianus* sp. nov., Peru, **Morrow (1)** p. 8 figd.

Tetraodon flecointrei sp. nov. Neogene W. France, **Leriche (5)** pl. iv figs. 37, 38; *T. leiurus brevisrostris* spawning, care of eggs, **Geiser**; *T. schoutedeni* breeding habits, **Merckens**; *T. somphongsi*, territorial behaviour, threat display, food, **Lüling (1)**; behaviour in aquarium, **Ostermüller (1)**.

DIODONTIDAE

Key to Ceylon species, **Silva (3)**.

Key to Tasmanian forms, **Scott, E. O. G.**

Chilomycterus galapagosensis sp. nov. Galapagos Arch., **Klausewitz (5)** p. 82 figd.; *C. orbicularis* from Ceylon waters, **Silva (3)**.

Diodon cf. *holacanthus* figd., Pliocene Japan, **Ozaki**; *D. †scillae* figd., **Tavani**.

†*Kyrtogymnodon* gen. nov. type *Diodon capellinii* De Stefano, Pliocene, Siena, **Tavani** pp. 180, 190 pl. ii fig. 6.

†*Oligodiodon* gen. nov. type *Diodon acanthodes* Sauvage, Upper Miocene, Sicily pp. 181, 190; *O. a. liburnica* var. nov. p. 190 pl. ii fig. 7; *O. platyodus* figd., **Tavani**.

†*Progymnodon gigantodus* figd., **Tavani**.

MOLIDAE

Masturus lanceolotus new to Echigo Province, Japan, **Honma (1)**.

Ranzania truncata new Moroccan record, **Furnestini & others**; from Malabar coast, **Chacko & Mathew**.

XENOPTERYGII

GOBIESOCIDAE

Aspasmodes gen. nov. p. 397 type *A. briggsi* sp. nov. Seychelles, p. 398 figd., Smith, J. L. B. (5).

Gobiosox daedalus boreus; *G. stenocephalus*, location of types, Mead (3); *G. strumosus* from Cedar Key, Florida, Caldwell (2).

Lepadogaster experiments on osmoregulation, Raffy.

Parvicrepis parvipinnis new W. Australian record, Milward.

Pherallodiscus varius location of type, Mead (3).

Tomicodon eos rhadinus location of type, Mead (3).

HAPLODOCI

BATRACHOIDIDAE

Batrachus rossignoli p. 221 figd., *B. budkeri* p. 222 figd. spp. nov. Pointe-Noire, E. Africa, Roux in Collignon, Rossignol & Roux.

Halophryne Australian species, Whitley (7).

Opsanus analysis of sounds produced, Tavolga (1).

Porichthys porosissimum bioluminescence, Shoemaker (1).

PEDICULATI

ANTENNARIOIDEA

ANTENNARIIDAE

Antennarius glauerti sp. nov. W. Australia, Whitley (5) p. 207 figd.; new Queensland record, Whitley (2); *A. marmoratus* development of eggs and larvae, Padmanabhan; *A. melas* recorded from western Indian Ocean, *A. commersoni*, *A. tuberosus* recorded from Aldabra, Smith, J. L. B. (9); *A. ocellatus* from Cedar Key, Florida, Caldwell (2); *A. pauciradiatus* correction in text and figure, Schultz, L. P. (2); *A. pinniceps* taxonomy, Bauchot-Boutin; *A. scaber* ovarian structure and embryology, Rasquin (3).

Histrio structure and release of egg raft, Rasquin (3); *H. histrio* ovarian structure and early embryology, Rasquin (3); new Moroccan record, Furnes-tin & others; colour change and environment, Breder & Campbell.

Kanazawaichthys scutatus Schultz a prejuvenile of *Antennarius radiosus* Garman, Hubbs, C. L. (3).

OGCOCEPHALIDAE

Halieutichthys aculeatus recorded from Venezuela, Martin, S. F. (3).

Malthopsis lutea new S. African record, Smith, J. L. B. (14).

Ogcocephalus darwini sp. nov. Galapagos Islands, Hubbs, C. L. (2) p. 161 figd.; *O. vespertilio* ovarian structure, Rasquin (3).

CERATIOIDEA

MELANOCETIDAE

Melanocetus megalodontis location of type, Mead (3).

Xenoceratias nudus location of type, Mead (3).

HIMANTOLOPHIDAE

Himantolophus azurlucens location of type, Mead (3).

Lipactis megalops location of type, Mead (3).

ONEIRODIDAE

Chaenophryne crossotus location of type, Mead (3).

Dolopichthys gladisfenae; *D. tentaculatus* location of types, Mead (3).

Lasiognathus beebei location of type, Mead (3).

Lophodolus lyra location of type, Mead (3).

Trematorhynchus adipatus; *T. moderatus*; *T. multilamellatus*; *T. multiradiatus*; *T. paucilamellatus*, location of types, Mead (3).

GIGANTACTINIDAE

Gigantactis large specimen described from Florida, Robins & Courtenay; *G. perlatus* location of type, Mead (3).

CERATHIDAE

Cryptopsaras couesi description of ♀ with parasitic males, Shoemaker (2).

LINOPHRYNIDAE

Aceratias edentula, location of type, Mead (3).

Diabolidium arcturi, location of type, Mead (3).

Haplophryne hudsonius, location of type, Mead (3).

Linophryne brevibarbata; *L. quinqueramosus*, location of types, Mead (3).

OPISTHOMI

MASTACEMBELIDAE

Caecomastacembelus gen. nov. p. 388
type *C. brichardi* sp. nov. Belgian
Congo p. 389, Poll (2).

Mastacembelus armatus development
of chondrocranium, Bhargava; alimentary
canal, Nager & Khan; *M. nigromarginatus*, Daget (6); *M. victoriae*,
food preference and adaptability,
Corbet (1).

SYNBRANCHII

SYNBRANCHIDAE

Synbranchus marmoratus respiration
and amphibious habits, Lüling (4).

CROSSOPTERYGII

†RHIPIDISTIA

HOLOPTYCHIDAE

Holoptychius nobilissimus scales rec.
Dura Den, Wattison.

OSTEOLEPIDAE

Pennagnathus nom. nov. for *Glyptognathus*
Woodward 1891 pre-occ., Whitley (1) p. 44

ACTINISTIA

COELACANTHIDAE

†*Holophagoides* nom. nov. for *Diplurus*
Newberry 1878 pre-occ., Whitley (1) p. 44.

Latimeria chalumnae, Due Rojo; Schaeffer; summary of present knowledge, Trewavas (2); skeleton and muscles, Millot & Anthony (1); regulatory organ in supra-branchial, Millot & Anthony (2).

†*Rhabdoderma* sp. scales figd., Vangerow.

DIPNOI

LEPIDOSIRENIDAE

Protopterus aethiopicus reproduction, early development, Greenwood (3); description of burrowing habits, Marlier (1); *P. amphibius*, Wager; *P. annectens* from Middle Zambezi system, Jackson, P. B. N.; study of blood, Plessis; histology of pancreatic islet system, Leiner & Schmidt; *P. dolloi* ethology of reproduction, Brien, Poll & Bouillon (1); breeding habits and behaviour of larvae, Brien, Poll & Bouillon (2).

CORRIGENDUM

Vol. 92 1955 p. 71: under family Cetomimidae in sixth line insert "sp. nov." after *cubiceps*.

